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Drilling Parts for Cash Registers

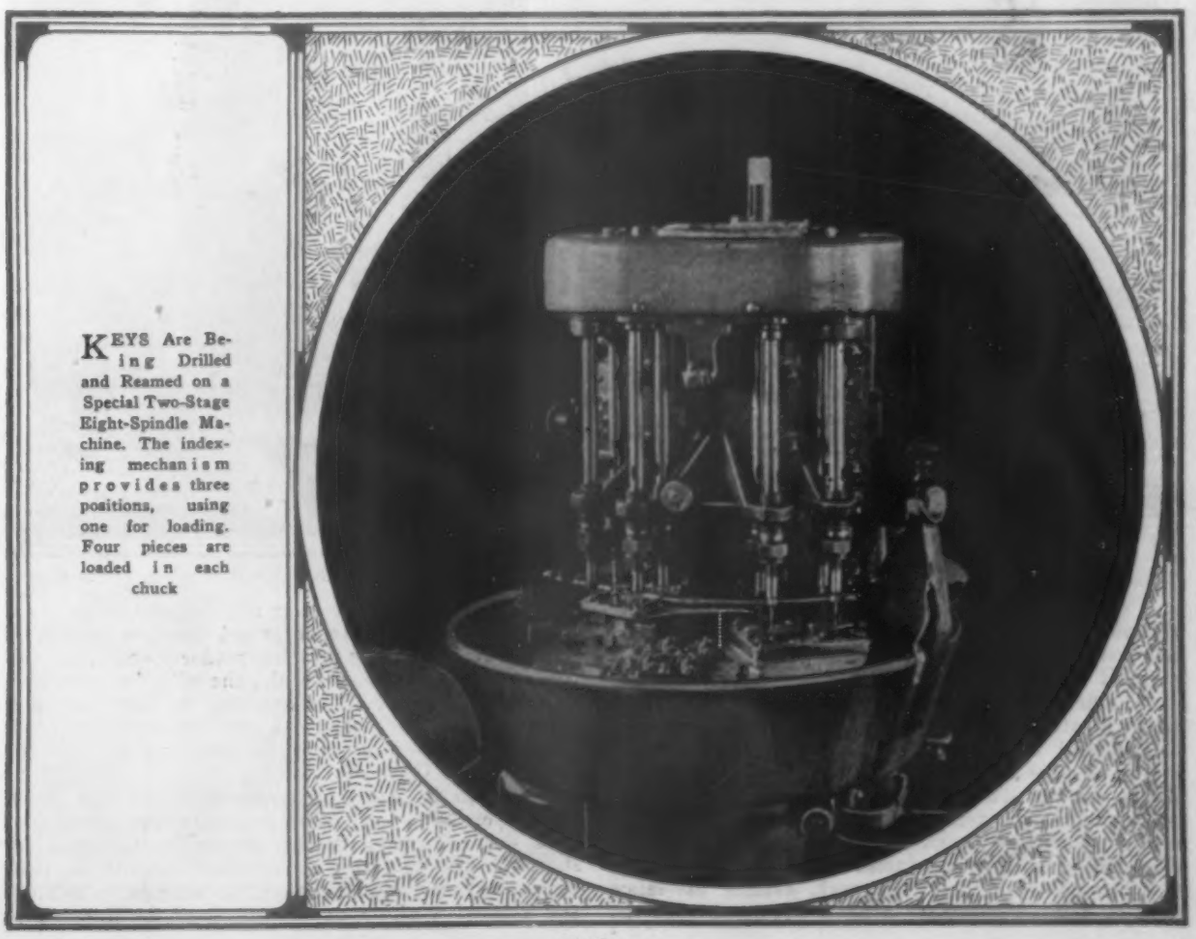
National Plant Has Developed Combinations of Operations and Some Special Machines to Save Labor—Universal Engraving Machine

BY L. S. LOVE

At the plant of the National Cash Register Co., Dayton, Ohio, are two departments called drilling divisions. Although neither is devoted exclusively to drilling operations, this class of work predominates in each. Drill No. 1, so-called, employs men, while the other employs women. In each are several operations of interest, because of type of machine used or of time saving. Oddly enough, those jobs which stand out as particularly unusual are not drilling work.

In the first of these departments, one of the labor-saving operations is an improvement in the method of drilling and reaming class 800 and 900 register keys, which are the levers to transmit motion of finger pressure through the operating mechanism to the indicating parts on those two models of register. The method formerly in use was the employment of two two-spindle sensitive drills, on which work was turned out at the rate of 2200 pieces per operator per day. Two operators were needed to produce the required output by this method.

Since the development of a special machine one operator produces 4500 drilled and reamed keys per day. The machine is equipped with two groups of four spindles each. One group drills, the other reams. The

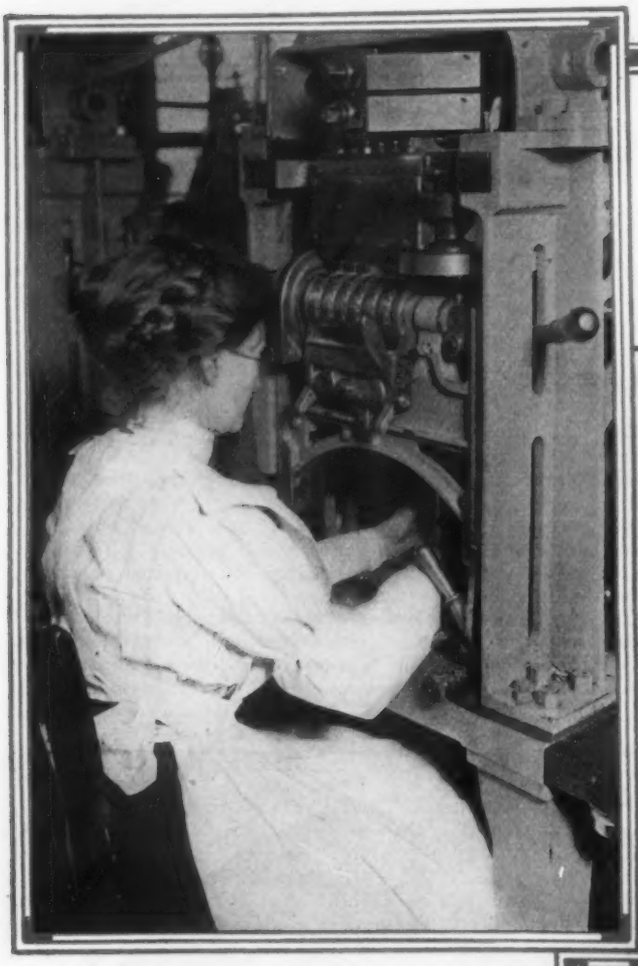


KEYS Are Being Drilled and Reamed on a Special Two-Stage Eight-Spindle Machine. The indexing mechanism provides three positions, using one for loading. Four pieces are loaded in each chuck

table of the machine is arranged to index and has three stations, which are provided with three sets of fixtures to hold four keys to each set. The first position is the loading station. From it the table indexes to carry the keys to the group drilling spindles and thence to the reaming position, finally being indexed back to the loading position for removal of drilled keys and replacement with undrilled blanks for the next cycle. Thus, while the operator is loading and unloading one fixture, the work held in the other two is being drilled and reamed respectively. The fixture at the loading station, when unloaded, is cleaned free of chips, prior to reloading, by a blast of air from a hose fitted with a shield which fits over the fixture.

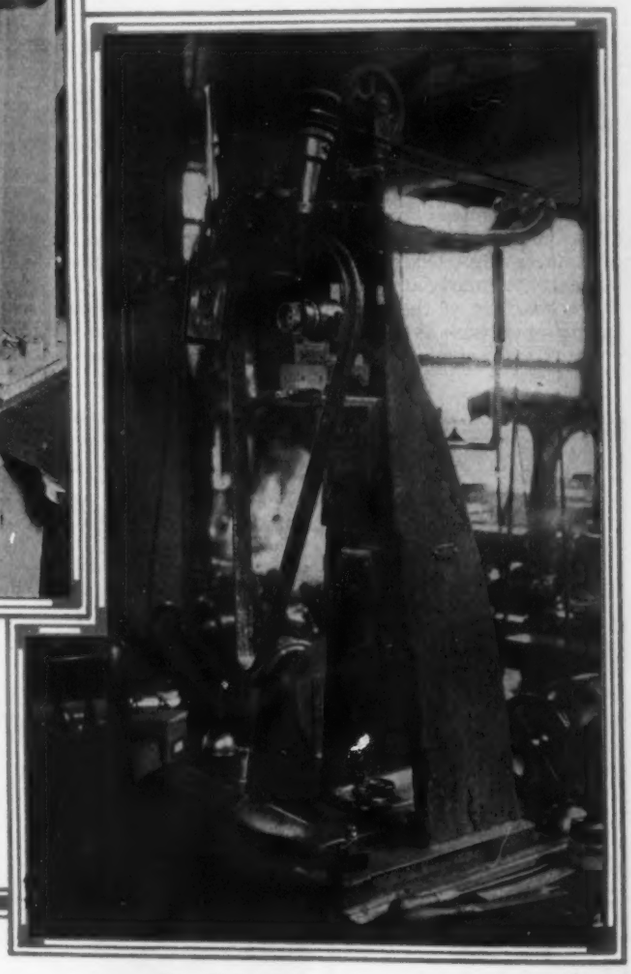
Another operation in this department which may be worth mention as being rather unusual is the use of a cluster-head multiple drill on a small brass casting known as class 800 cylinder. It was formerly the practice to use two six-spindle sensitive drills for the various drilling and reaming operations on this piece, requiring two operators. Now one man operating a cluster-head drill, with spindles set in two groups, and a two-spindle drill does the work, cutting the labor item in half. The cluster head is arranged with the spindles in two groups, drilling and reaming in two strokes of the machine.

In this department, as in others at the plant, it was emphasized that the regular inspection of all jigs in the tool crib between return from one job and issuance on another has effected a big saving. The use of sub-plates on all drills has been effective in keeping the machines in good condition. These plates are planed from time to time. Their use avoids accidental drilling into the table proper.



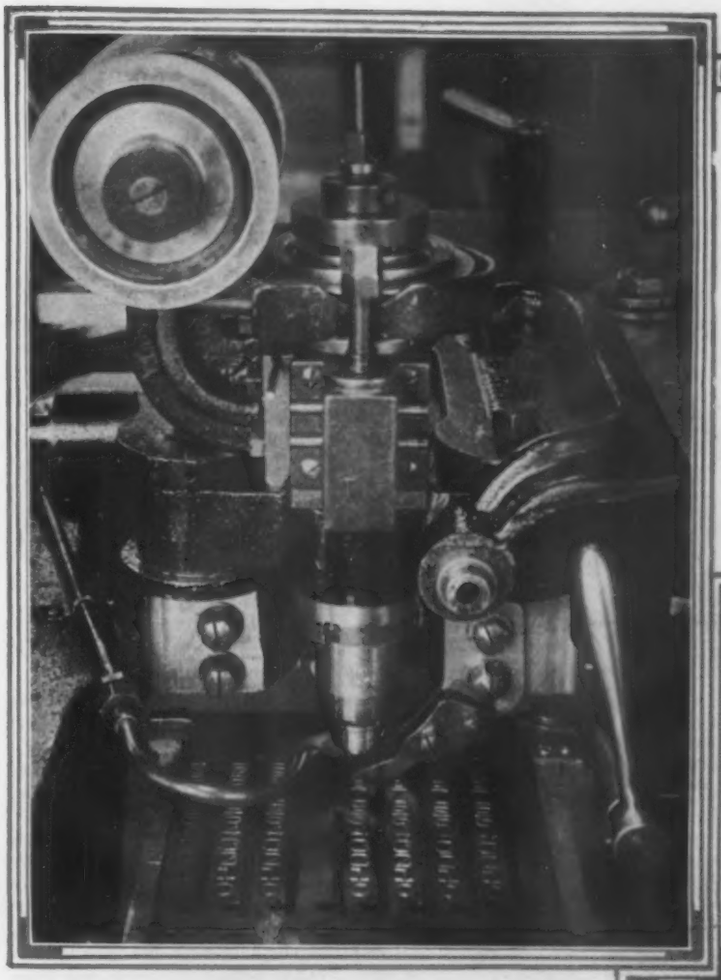
The Multiple Machine Routes Six Printer Wheels of the Same Kind at Once. Six cutters are controlled by one master—at right

Production Engraving Is Done on Single or Multiple Machines of the Company's Own Design



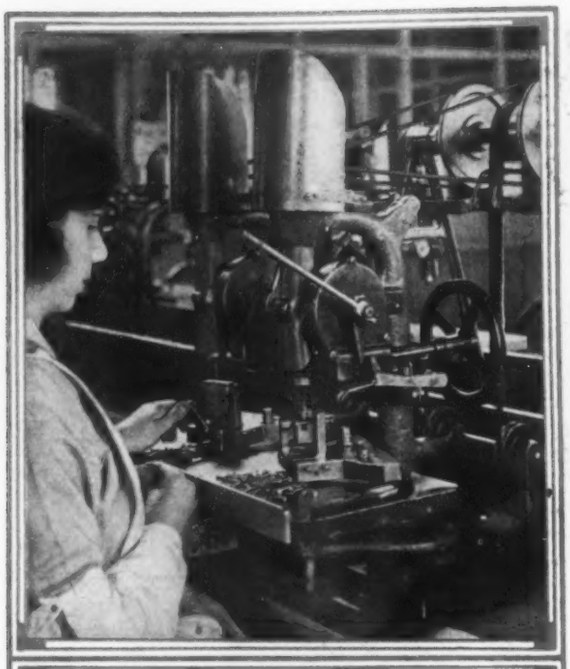
Where reaming operations are required to be more accurate than it is possible to get them on automatic screw machines, screw machine products such as small collars are reamed on a speed lathe with foot-operated collet. This permits the operator to show unusual speed, as both hands and one foot are used, one hand loading, the other operating the reamer spindle in the foot stock of the lathe.

Drill No. 2 handles a large variety of the small parts, there being some 6000 parts and 9000 operations. This department, employing women, is operated on shorter hours than other departments and also has rest periods morning and afternoon. In addition to drilling and kindred work, other operations of the light class



The Universal Engraving Machine Is Truly Universal in That It Will Engrave Practically Any Size or Shape of Character from the One Master

Machine Working on the Pantograph Principle Is Employed to Engrave Special Plates



USUAL Practice Is to Employ, Where Possible, Commercial Machines, but This Semi-Automatic Two-Spindle Drill Was Built by the Company

readily done by women are performed in this division. These include engraving of all printing wheels used to print checks issued by cash registers, making of springs, assembly of many small parts and counters. There are three kinds of engraving machines used, single, multiple and universal, the masters for all of these machines being made in a separate division at the plant, known as the small tool department.

The single engraving machine is the one most extensively used. It carries a triangular cutter in a high-speed spindle. Immediately above the cutter on the spindle sleeve is hung a bow which extends down to the operator's position. This bow carries the guide pin which follows the master. The work is set on an indexing arbor just below the ways of the sliding cutter head. With this machine a half hour is required to engrave a printer wheel, which consists of routing out the background, leaving the figures in relief.

The multiple machine works on the same general principle, except that it carries six blanks, on which work is done simultaneously. The masters for this machine are carried on a dial which indexes, bringing the desired figure into operating position. This machine turns out six wheels in a half hour. Some wheels requiring special features or finish are afterward finished by hand.

The universal engraving machine is used for class 900 lever index plates, special plates and other work not in regular printer wheel production. This machine works on the pantograph principle. The engraving lever is mounted on ways with master plate on the front of the machine. This machine pays both the company and the operator. Work which required a high-priced man a day to perform by hand is now done in two hours. The rate paid per hour is half the former rate, but the operator makes more.

Class 800 index type segments, which are now engraved on the single engraving machine, can be done on this also. Different forms of characters can be made by merely turning levers. The same pattern, known as the master character, is used to produce these different types and make any size characters within the capacity of the machine, of ratios 4 to 1 and 16 to 1. Characters can be narrowed without changing the length, or they can be shortened without changing the width, by moving one or two levers. Cut-in, raised, or shaded characters can be produced.

The engraving is done on the same principle as in the other engraving machines. The characters are put on the master slide and the follower guided around the character by hand, the cutter reproducing what has been followed. The cutter is triangular and ground to a fine point. This moves in any direction in which the handle, or follower, is moved.

While the machine is big, it is easily operated, as the follower can be guided by one hand. All levers are ball-bearing and it is run by a ¼-hp. motor. It is a self-contained machine, having the motor on one side. There is also an air pressure device to blow off the chips when the character is engraved. When the cutter is raised the air is automatically shut off; when it is lowered the pressure is started again.

There is a work slide on which rests the plate to be engraved. The plate, 6 in. by 7 in., turns on a turret to graduations of 15 deg. This enables the plate to be turned at an angle backward, forward or sideways. A stop on the side is used for alining the various words. There are three devices for controlling the characters, a gage in front for spacing characters, a gage in back for the height and an index on the side for the width of characters.

Cutters used in these engraving machines, which are made in the small tool divisions, are maintained on a honing machine kept in the department tool room. It consists of an India oil stone which has a revolving, oscillating motion. It laps three sides of the cutter, the latter being held in a special fixture with a triangular rest on a supporting plate. The life of cutters is increased materially in this manner.

Another saving in this department has been effected through the installation of commercial spring winding machines, which are turning springs at the rate of seven to one as compared with the former method.

Several special drilling machines and millers have been designed and built by the company for this department. One is a two-spindle semi-automatic machine, which has counterparts on the market. The operator loads the fixture under one spindle while the other

SATISFACTORY Results and Longer Life May Be Expected from Engraving Cutters Honed on This Special Machine

COUNTER Wheels Are Drilled, Reamed and "Cammed" in a Special Indexing Machine with Automatic Unloader

spindle is drilling and returning to top position. Other machines are entirely special, in that there are no commercial machines which would exactly meet the conditions for which they were designed.

One machine for drilling, reaming and "camming" or spot-facing counter wheels, has a dial feed with six stations. The operator loads in order to index the piece for proper location of the camming operation. The machine unloads automatically by means of a trip dog, which removes the wheel from the fixture and drops it into a chute.

Counter action pawls are drilled and counterbored in a special semi-automatic machine which requires only loading by hand. This machine has a dial, rotating on a horizontal spindle, with twenty positions or work chucks. The drill spindle at the back of the machine is horizontal, on the same plane as the dial spindle but at right angles to it. The drill cam is operated for in and out feed. The dial makes one revolution per minute, which permits an output of 20 pieces per minute, five times as many as the old way of doing the work.

For milling pawls, at the end which engages in the splined countershaft of the register mechanism, a dial feed machine was developed, which is continuous in operation. It is loaded by hand, operating slowly while cutting, loading being done at the same time. Between cuts the dial turns faster, giving quick traverse from station to station. The dial rotation is accomplished through worm and worm gear reduction, with a helical gear train in the drive line. The speed change for fast traverse is accomplished by a change in pressure angle of three of the teeth in the helical gear drive. The ratio is such that the cycle of the helical gears corresponds with the operating cycle from station to station. Another special milling machine is one designed to mill three or four steps on pawls which operate counter wheels.

One section of the tool room in this department is devoted to a file containing a finished sample of every piece in the department production. Each piece is tagged. Each operator draws the sample before starting on an operation, to see just what the piece looks like. In this way a close check against mistakes is made when changes are under way. When a change is contemplated, a tag attached to the sample instructs the operator to see the job foreman.

Assembly of counter mechanisms is made in this division, the sub-assembly going from there to the general assembly.

A method of determining piece rate molding prices is to be discussed at a meeting of the Quad City Foundrymen's Association, Rock Island Club, Rock Island, Ill., on the evening of April 20 by W. M. Thomas, Union Malleable Iron Co., and by J. H. Ploehn, French & Hecht, Davenport, Iowa.

Clutch Pulley Drive for Drilling Machine

A clutch pulley drive arrangement has been provided for the No. 210 single-purpose all-geared drilling and tapping machine of the Barnes Drill Co., Rockford, Ill., a motor-driven model of which is described in THE IRON AGE of Nov. 6, 1924. The clutch is of the multiple-disk type and is inclosed in the box with the bevel driving gears. It operates both in driving the spindle in the drilling direction, and in reversing when the machine is equipped with an automatic reverse for tapping. A hand lever on the vertical shaft at the right-hand side of the machine actuates the engagement and disengagement of the clutch and may be adjusted to any position to suit the convenience of the operator. When the clutch is disengaged a brake operates automatically on the hub of the driving gear, stopping the spindle instantly.

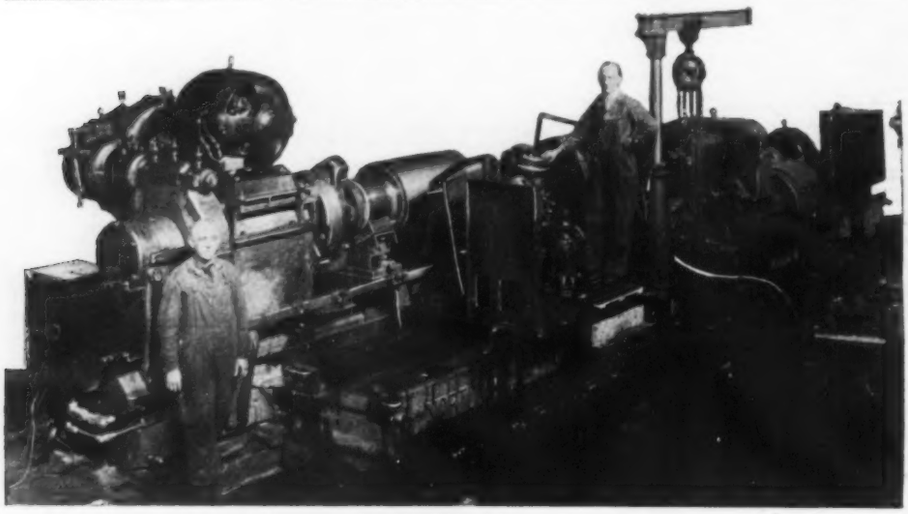
CHANGE in Pressure Angle of Some of the Teeth in the Helical Drive Produces a Variable Feed in This Continuous Pawl Milling Machine, Providing Suitable Milling Feed with Fast Jump Between Stations

Roll Grinder for Bethlehem Steel Co.

One of the three large roll grinding machines built recently by the Norton Co., Worcester, Mass., and mentioned in THE IRON AGE of Jan. 22, is illustrated herewith. The machine shown is for the Sparrow Point plant of the Bethlehem Steel Co., where it will grind the chilled-iron rolls used in mills rolling boiler plate and similar materials. While the machine is not a new general type, the design incorporates various refinements intended to make it the last word in equipment of its kind. Its capacity for work is up to 50 in. diameter and 14 ft. length.

In use the chilled-iron rolls become worn and pitted, and when the limit of required accuracy is passed they are reground to a true smooth cylinder. The former usual method was to turn the roll face in a roll-turning lathe, which is a comparatively difficult operation because of the hardness of the material.

The roll grinder illustrated is entirely self-contained, power being furnished for the several drives by motors mounted on the machine. The work is revolved by a 20-hp. motor mounted on the headstock, while a 40 hp. motor mounted on the carriage provides power for the wheel drive and the automatic table traverse. A 2½-hp. motor drives the pump which supplies the grinding lubricant. The machine is controlled from one position, the operator standing on the wheel carriage as it moves back and forth past the work. The weight of the machine is about 53 tons; that of the rolls which it grinds from 3½ to 5 tons.



Roll Grinder with Capacity for Rolls up to 50 In. in Diameter and 14 Ft. in Length. The machine is entirely self-contained, and is controlled from one position, the operator standing on the wheel carriage as it traverses

Poor Outlook for American Machine Tools in Europe

A Cincinnati machine tool executive, just returned from Europe, states that conditions abroad are such that American machine tool builders cannot expect much business from European countries in the immediate future. In Germany machines that are exact duplicates of American machines are being made and sold at half of the price now asked for the same machine by American companies. Italy offers the best market for American sales, but even in that country, American manufacturers are handicapped by the unfavorable rate of exchange. French machine tool builders are producing cheap machines at present and have a fair market for them.

At its Ohio Works, Youngstown, the Carnegie Steel Co. has completed installation of a new slag crushing plant, to reduce the slag from its six blast furnaces in this group. To facilitate construction of the new plant, the old one which was displaced was razed by dynamiting after the salvage parts had been removed.

Apparatus for Testing Commercial Oxygen

A new apparatus for testing the purity of oxygen has been designed and put on the market by Eimer & Amend, Third Avenue and Eighteenth Street, New York. It consists essentially of a specially shaped pipette, containing copper coils immersed in a copper chloride solution, and a measuring burette graduated to read 0.01 cc. or milliliter. The special shape of the pipette and of the coils is claimed to avoid retention of bubbles, a feature quite desirable in a gas-testing apparatus because otherwise inaccurate readings might result. The ammoniacal copper chloride solution insures complete absorption of oxygen without the danger incident to a phosphorus absorbent or the formation of a carbon-monoxide gas formed by the action of high purity oxygen on pyrogaloll. The shape of the burette body and the small diameter of the stem are such that the burette is accurately calibrated and graduated to read in hundredths of 1 per cent. The apparatus is adapted to determine the purity of commercial oxygen, particularly in the higher ranges.

To Publish Information on Industrial Poisons

A series of data sheets on common industrial poisons is to be issued under the supervision of the industrial poisons committee of the chemical section of the National Safety Council, 168 North Michigan Avenue, Chicago.

The list of substances for which the tentative data sheets have been prepared includes aniline, arsenic, benzol, carbon bisulphide, carbon monoxide, chlorine, chromium, hydrogen sulphide, lead, manganese, nitrous fumes, phosphorus, toluol and picric acid. The data sheets outline the mechanical forms of exposure to the material, the characteristic medical symptoms and also general preventive methods or precautions to minimize the danger. Advice is given on special training or emergency equipment to meet acute exposure that may result from accidental leakage or repair work in tanks. A. L. Watson, Hooker Electrochemical Co., Niagara Falls, N. Y., is chairman of the chemical section.

F. L. Wolfe, technical superintendent, Ohio Brass Co., Mansfield, Ohio, will be the speaker at the regular monthly meeting of the Pittsburgh Foundrymen's Association at the General Forbes Hotel, Pittsburgh, Monday evening, April 20. His subject will be "Sand Control," in which he will review his methods in reducing foundry losses and molding sand costs more than 50 per cent in the past year.

Sentiment in Long Owned Machines

A Modern Shop Instance in Ancient Setting, with the Meaning of the Parable Not Far to Seek

WHEN a builder of machines gets a request for repair parts for one of his creations long obsolete, he has mixed emotions, some of which need not be described. There comes also the thought that here is another case of a manufacturer who holds away at arm's length any consideration of the economic life of his equipment. Recently a request for a part for an aged machine tool (the maker's name having been lost) was printed in a business paper. This caught the eye of George R. Woods, of R. S. Stokvis & Sons, Inc., New York, whose long connection with the machine tool industry caused an immediate reaction. Relieving the safety valve was a resort to literary expression and the following shop parable was the result:

The Waggish Shop Czar and His Paleozoic Machines

THERE was once a shop owner who was a wit. To tell the truth he would rather be waggish and illogical than be staid in his speech and logical in his thought. So it came to pass that his fondness for witticism became almost a vice, if we may call that a vice which steadily interferes with our best work.

Now this manufacturer, like so many of his craft, was a good, bright mechanic who had built up his own business. There he ran things like a petty czar. True, he had no crown or scepter, unless one could call the old straw hat he wore around the shop a crown, and the big pencil perched on his ear a scepter. Just the same, that straw hat meant as much to him as the average reigning sovereign thinks of his crown. That hat was distinctive, especially in midwinter and seemed to divert the attention of those who talked to him and made them easy victims of his jocularity.

As we have already seen, this man was an individualist and he ruled his shop with all the bias of a spoiled and petty autocrat. Two groups were the main victims of this autocracy. The men in the shop were one group and they probably suffered more than the machinery salesmen, who made up the second group. The employees of Old Straw Hat, as we shall call him, really did suffer. They suffered because they liked Old Straw Hat; maybe their liking was based on pity for his childish weaknesses. Because they were attached to him they stayed in his old factory, where many of the machines were of Biblical simplicity.

In time these employees became real shop magicians. They pushed their ingenuity to such a degree that they became freaks. That is, they lost all real shop sense to become keepers of prehistoric machines in Old Straw Hat's mechanical zoo. Every so often a workman would lose patience with some dinosaur of the shop and tell Old Straw Hat he ought to get a new machine. Old Straw Hat would pause a moment and then fall back on one of his pet witticisms, saying, "There's life in the old girl yet, isn't there?" Well, of course, there was life, at least a spark of life when the workman furnished the oxygen; but when Old Straw Hat personified the tool and made it a "her" and an "old girl," the mechanic forgot his grievance and beneath his grumbles developed a false sympathy for the machine.

The machine tool salesmen also told Old Straw Hat he ought to get a new machine. They would prove the economy of scrapping the old machine and purchasing a new tool. But Old Straw Hat always regarded criticism of his shop equipment as a personal affront. He felt called upon to defend his old iron and steel servitors. He would speak affectionately of his antiques. "The old hoss still has a good pair of heels," or, "We've fit and bled together and we've both got plenty of fight left." True, he had no real affection for these tools, but no one ever dared tell him his apparent affection was only a mask for his parsimony.

One day a machinery salesman called and let the old man expatiate. The salesman waited for an opening. In speaking of a pliocene lathe the salesman wanted to replace, Old Straw Hat said, "There's life in the old girl yet." "Yes," said the salesman, "there is life of a sort, an artificial and expensive life, because your mechanic is coddling that bit of senility like a baby, but there is no economic life there. No useful life. No productive life." Old Straw Hat shifted to the other foot and said he would think it over. "Economic life, eh!" Salesman had really opened his eyes. Yes, he would heed the lesson.

Now this salesman didn't go and marry Old Straw Hat's daughter, as you may suppose, and then rebuild the business, for Old Straw Hat didn't have any daughter. Neither did the salesman sell a single machine. When he came back a week later with his quotations and a complete shop layout, Old Straw Hat was dead. Some young fellows out in Dubuque had a man there ready to negotiate for the old trademarks and a few patents. They had been getting most of the business away from Old Straw Hat for some time. They were a bit sentimental about their shop, too, but their sentiment was in the right place.

25-Year Old Lathe Now Needs New Parts

About twenty-five years ago we bought a small lathe from an advertisement. We now need some parts for the lathe and have lost the address of the company we bought the lathe from. Think it was manufactured somewhere in the New England States.

The lathe is a 10-in. swing, 40-in. centers, foot power, and countershaft for engine. The price of the lathe was $75 for the foot power and $90 for the countershaft attached. Can you give us the address from the above description of the manufacturer?

The wage scale and working conditions for the year beginning July 1 next, to be presented by the Amalgamated Association of Iron, Steel and Tin Workers at the annual conference of a committee of that organization and representatives of the sheet, tin plate and bar iron manufacturers at Atlantic City some time next month, has been formulated and will be submitted this week at the annual convention of the Amalgamated Association now in progress at Pittsburgh. Details of the demands will not be available until after the convention has heard and adopted them.

NEW CUTTING PROCESS

Heavy Risers Removed by Oxy Acetylene—Improved Methods of Designing Possible

CUTTING of heavy risers by the oxy-acetylene blowpipe in steel foundries has enabled foundrymen to be entirely independent of former limitations as to size and location of these risers.

Certain places on each casting or design should be fed by a generous pool of molten metal. This ideal has been all too often compromised, simply because it was next to impossible to remove the risers from the inaccessible places where they were needed most. A case in point is furnished by the plant which produced the work illustrated here.

The Steam Turbine Cylinder Casting Has Risers of 12 to 20 In. in Thickness. At the left is a marine gear weighing 40,000 lb. with risers forming an almost continuous ring about the top

Cutting Risers from Turbine Cylinder Castings

Most of the heavy cutting done at this foundry consists in removing risers ranging in size from 8 or 10 in. up to 20 in. The steam turbine cylinder casting illustrated is an example. In this work the risers vary in thickness from 12 to 20 in. One man with a blowpipe working alone on such a casting could probably have cut these risers within a reasonable time; but the management realized that such work was not a one-man job. They concluded that additional money spent on labor and equipment would be returned in the final finishing. A machine cutting blowpipe with a straight line machine as accessory is now employed, operated by three men; a cutter and two helpers. One helper maintains proper gas supplies and pressures and the other assists in holding the cut to the proper line. Cuts made in this way are very smooth, close to the line, and require a minimum of time for final finishing.

More fundamental is the development at this plant in the design of the larger molds. The huge marine gear shown, which weighed 40,000 lb. rough cast, is an example. The risers do not take the customary shape, of stems with projecting heads, but form an almost continuous ring about the top of the casting. The six segments are separated only by narrow spaces. Good quality steel for the face of the gear, where clear, clean steel is most needed, is supplied at every point by a generous pool of hot metal just above. The improvement in the quality of the work is natural. But this method of pouring could be adopted only because of full confidence in the ability of the oxy-acetylene process to cut the risers smoothly and economically.

Round Billets Defined for Rate Purposes

A. R. Kennedy, traffic manager Pittsburgh Steel Co., Pittsburgh, who has been chairman of a committee of industrial traffic managers having the matter in charge, has announced a definite settlement of the description of round billets of 3-in. and over that shall carry the unfinished steel tariff in the Central Freight Association and Trunk Line Association territories. The description follows:

"Under the item of iron and steel billets, other than copper clad, the rate will apply on unfinished material, rough hot-rolled and not smooth or surface finished, commercially known as round billets, to be re-heated for the purpose of re-rolling, forging, hammering or piercing, which can be transported on open cars without damage from the weather and which is of the following description: Billets, round shaped, in cross-section, the diameter of which is 3 in. or over."

The shippers and consumers have agreed to show on the bills of lading covering such round billets the size of the billet when 3 in. and over in diameter, for what purpose it is intended, namely, to be re-heated for the purpose of re-rolling, forging, hammering, or piercing, and it is the carriers' and inspection bureau's desire that this agreement be carried out to help them properly police these shipments. Therefore, all shippers should show this information on the bills of lading from Feb. 15, 1925. Necessary cancellation of corrections which were issued on billings covering past shipments raising the shipments to higher than billet rates have been cancelled to Jan. 1, 1923.

Electric Heating Unit for Tempering Baths

A new immersion heating unit recently developed by the General Electric Co. consists of helicoil sheath wire cast into iron. This unit was designed for use in oil tempering baths and melting pots used for melting lead, tin and alloys which will not attack iron.

The units employed for oil tempering baths utilize the cast-in feature only on the portion of the sheath which dissipates heat at the bottom of the tank. On the units for melting pots, however, the cast iron is brought up on the neck of the unit and out of the pot. This neck is heated to allow for expansion of the metal when cold metal is being melted, thus preventing blow-ups. The cast iron also protects the steel tube of which the sheath wire is made from corrosion by the molten metal. The casting is provided with ribs to increase the radiating surface and to maintain the temperature of the heating unit at a relatively low point.

These units are being made in capacities up to 5 kw. and are sold either individually or incorporated in melting pots and tempering baths.

Pig Iron Tariff Inquiry is Reopened

Commission Agents Interview Blast Furnace Operators in the East—Court Decision Has Important Bearing on Flexible Provisions of Law

BY L. W. MOFFETT

WASHINGTON, April 14.—Reports have been coming to Washington of late that a movement was under way to petition the next Congress for a general upward revision of the present Fordney-McCumber tariff act. Increases in imports of a number of iron and steel products, together with the tapering off of exports of such products, has created apprehension and some iron and steel interests have indicated their purpose to seek higher tariff duties, either under present flexible provisions or through legislation, or both. Then coming on the heels of this movement cotton manufacturers held a conference in Washington last week and among its avowed purposes was the instituting of a movement for higher duties because of heavy imports of textiles which they claim are coming into the United States at prices which they say they cannot meet.

President Coolidge's Position

When President Coolidge addressed the conference, he discussed at length the tariff issue and there were those who assumed that, while he did not say so directly, the tenor of his remarks indicated that the Administration was favorable toward a general upward revision of the tariff. This impression is claimed to have been entirely incorrect and there are some who say that it was partially due to the apparent eagerness of Democratic politicians to construe the President's remarks in the light indicated. The latter came out with a challenge for the Administration to attempt general tariff revision. As a matter of fact, however, prominent Administration men say that there was nothing in the President's remarks to indicate that he was favorable to tariff revision at the next Congress, but that on the contrary his remarks if anything indicated that he would oppose such a movement. In a word, his address was taken to be a vigorous defense of the protective tariff only. By no means, it was stated, did he advocate tariff revision. The opinion strongly prevails that there is not the remotest chance of any tariff legislation at the next Congress.

It seems evident that the only recourse for iron and steel and other manufacturers who are disturbed over incoming shipments in their lines is through action under either the flexible provisions or the anti-dumping act. It is also felt that if foreign currency becomes more stabilized, relief would be afforded. In the case of pig iron, proceedings under both the flexible provisions and the anti-dumping act are under way at the instance of Eastern merchant furnace interests. It is believed that the anti-dumping unit will make a report in the near future on its investigation concerning the so-called dumping of iron from India.

Investigation at Philadelphia

Word also has just come from Philadelphia that the Tariff Commission has reopened its investigation under the flexible provisions. The fact was not announced here. It is said that one of the commission's agents now is interviewing blast furnace interests in the Eastern section and that other sections of the country will be visited, so as to bring up to date data which the commission gathered about 18 months ago on the basis of a petition of Eastern furnace interests for an increase of 50 per cent in the duty on pig iron. It has not been made clear whether this investigation will be made abroad but the assumption is that it will be. At the same time, there are those in the iron industry who are of the opinion that even if the duty were increased 50 per cent, it would be of no particular aid in protection from competition abroad because the duty is only 75c. per ton and a 50 per cent increase would bring it to only $1.125.

The question of powers of the commission to obtain cost and other data from foreign producers is becoming more involved as a result of a decision handed down on Tuesday of last week in Washington by the District Court of Appeals in the Norwegian Nitrogen Products Co. case. The issue related to hearings under the flexible provisions and therefore has a bearing on any inquiry that may be made concerning iron and steel costs abroad.

The decision of the court is held to have struck a hard blow to the flexible provisions by reason of the fact that it declared that individual production costs could not be held confidential by the Tariff Commission. The Norwegian Nitrogen Products Co., a foreign producer, had gone to court in an effort to make the commission disclose confidential data as to domestic costs of producing nitrite. The comission held that the material was confidential and declined to reveal it.

Effects of Decision

Following the decision of the court, the commission issued a statement saying that if the court's interpretation of trade secrets as not including individual costs of products is to be carried out, it will make the administration of the flexible provisions of the law exceedingly difficult. The commission pointed out that the present tariff act did not confer any new investigational powers upon the commission but that all such powers are derived from the organic act of 1916, which created the commission and defined its functions. It is from that statute, the commission said, that it gets the right of access to the producers' books and the power to summons witnesses and to compel the production of books and documents.

The commission's statement adds:

To the exercise of these investigational powers, by means of which individual production costs are obtained, Congress annexed two fundamental conditions. Section 706 of the act of 1916 provides that no person shall be prosecuted on account of any matter as to which he may be required to testify or produce evidence. The second condition is the provision in Section 708 making it unlawful for any member of the Tariff Commission or any other Government officer "to divulge in any manner whatever, not provided for by law, to any person, the trade secrets or processes of any person, firm, co-partnership, corporation or association" embraced in any investigation conducted by the commission.

What Are Trade Secrets?

The inquiry thus reduces itself to the question whether individual costs of production are "trade secrets" in the sense of this prohibition. Prior to the passage of the flexible tariff, Congress had been repeatedly advised by the Tariff Commission's reports that section 708 was being construed as protecting individual costs of production, care being taken to state all information in such manner as not to disclose any producer's cost figures. It has been thought that Congress has recognized and sanctioned this view.

It is to be feared that a construction placed upon "trade secrets" confining the term to an unpatented secret, commercially valuable appliance, formula or process would, if generally applied, make the flexible tariff provision exceedingly difficult to carry out.

The commission cannot but feel that the protection of individual figures heretofore invariably accorded under the law against disclosing trade secrets is of vital concern to the effective execution of the present flexible tariff provisions.

Action in Nitrogen Case

In the nitrogen case, the Appellate Court had refused to issue a mandamus, pointing out that since President Coolidge had changed the rate on sodium nitrate, the matter was out of the hands of the Tariff Commission, but the court declared that the commission had been at fault in withholding the information sought. The commission actually won this particular case by reason of dismissal of the petition for a mandamus, but on a broad ground it is held to have lost heavily by the decision of the District Court, which seemingly means the commission cannot hold as confidential matter which it gathers and upon which its procedure has been based. In passing upon the nitrogen case, the court said that the commission's refusal "to disclose any of that information with the exception of the price of soda ash, reduced to little better than an empty form the right of the opposition to be present to produce its evidence and to be heard."

The court contended that the right of the opposition to produce its evidence meant nothing unless it had also the right to demand evidence from the other side, so as to get information concerning the cost of production of nitrites. In conclusion the court said:

Barring trade secrets and processes, the disclosure of which is expressly forbidden, the opposition, by virtue of its statutory right to be heard, was entitled to be informed of the facts and evidence privately presented to the commission for its consideration. Indeed, under the rules of the commission itself the Norwegian Nitrogen Products Co. should have been given an opportunity to examine the record and the reports of the commission or investigator in charge of the investigation.

The term "trade secrets" as ordinarily understood, means an unpatented secret, commercially valuable plan, appliance, formula or process which is used for the making, preparing, compounding, treating or processing of articles or materials which are trade commodities.

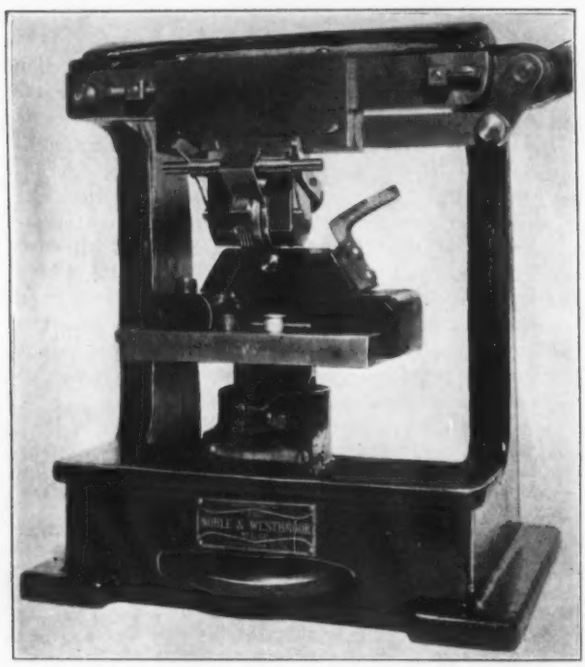
There is nothing in the record showing, and the appellee does not claim, that the making known of any of the costs of production involved the disclosure of any unpatented secret, commercially valuable plan, appliance, formula or process used for the making, preparing, compounding, treating or processing of articles or materials. For the purposes of this case, therefore, the costs of production demanded by the opposition cannot be regarded as trade secrets.

It is understood the decision will be appealed.

Machine for Serial Numbering of Round Parts

The marking of round parts with serial numbers that change automatically is accomplished by the machine illustrated, which is a recent addition to the line of the Noble & Westbrook Mfg. Co., Hartford.

The machine is a combination unit, being made up of a numbering head mounted in one of the company's



Combination Unit for Numbering Round Parts. The numbers are changed automatically

marking machines and provided with a mandrel for holding the work and a tripping device for automatic operation. The wheels of the numbering machine have hand engraved figures and are tempered to withstand hard usage. The marking machine is of bench type, weighs 60 lb., and is operated by means of a hand lever. The slide is arranged with roller bearings and the table is adjustable to various heights.

With suitable dies and work holders the marking machine itself may be used also for any lettering or numbering operation on either round or flat work within its capacity. The numbering head may be removed and used in a press for serial numbering on flat work.

Plant Used for Engineering Meeting and Demonstration

What is known as the electrical maintenance engineering section of the Electrical League of Cleveland held a meeting at the plant of the Cleveland Crane & Engineering Co., Wickliffe, Ohio, April 6. The company as host entertained the group of 210 guests at dinner in the plant dining room. Following the dinner, the party was conducted in sections through the plant, stopping for explanations in the pattern shop, the main machine shop, the foundry, tramrail shop, viewing two actual demonstrations of wire handling tramrail and locomotive handling cranes in the yard before returning to the general office for the evening program.

The program was opened by A. R. Hershke, superintendent of power of the Willard Storage Battery Co., who is chairman of the maintenance engineering section. Mr. Hershke emphasized the value of closer cooperation between manufacturers of equipment and maintenance engineers in industrial plants who have the responsibility of servicing and operating such equipment.

Addresses were given as follows: "Cranes and Their Uses," by J. B. Shaver, sales manager of the crane division of the Cleveland Crane & Engineering Co.; "Refinements of Electric Control of Overhead Conveying Systems," by E. T. Bennington, sales manager of the tramrail division; "Abuses and Maintenance of Cranes," by L. A. Gardner, electrical maintenance engineer of the Cleveland company, and "Application, Breakdowns and Maintenance of Cranes in Industrial Plants," by A. L. Reichert, electrical maintenance engineer of the Bourne-Fuller Co., Cleveland.

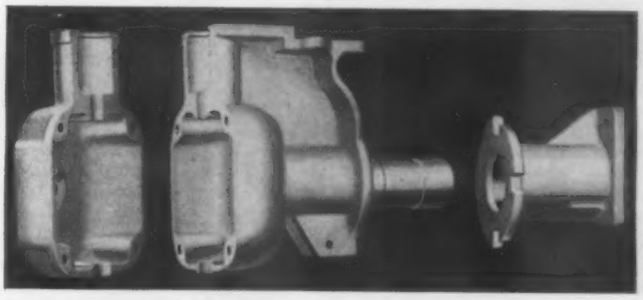
Interest of a highly educational value is being aroused by the series of meetings which the Cleveland electrical maintenance engineers are holding in the plants of manufacturers. The application of equipment to a wide range of uses described in connection with actual demonstrations at work and with photographs and slides in the plants of users is proving of great value in a better understanding of the use of mechanical handling and production equipment.

Four Classes of Die-Casting Alloys

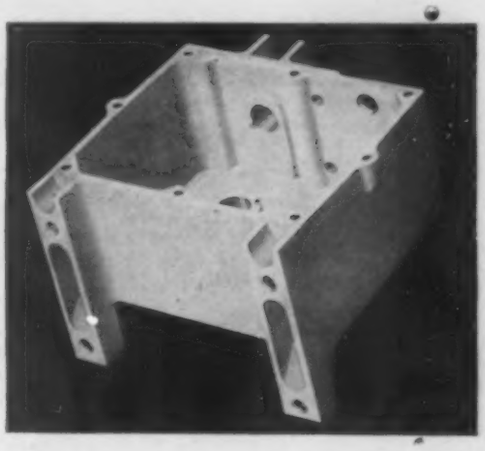
Bases of Lead, Tin, Zinc and Aluminum—Cost Saving by Reducing Machining Work—Inspection Important

BY DONALD L. COLWELL*

ALLOYS used in die-castings are of four types. The **lead-base** alloys are probably the simplest. They consist of lead alloyed with one or more of the following elements: tin, antimony, copper or bismuth. A typical analysis is that corresponding to S. A. E. specification No. 14, consisting of 75 per cent lead, 10 per cent tin and 15 per cent antimony. Lead alloys are necessarily comparatively soft unless the proportion of alloying element is so large as to make them brittle. In general, the ultimate compressive strength ranges from 10,000 to 20,000 lb. per sq. in. and the yield point from 2000 to 8000 lb. per sq. in. Brinell hardness of anywhere from 10 to 40 can be obtained. The specific gravity of lead alloys, of course, is high, ranging from 9.60 to 11.40, which is pure lead. Lead alloys are among the best to use where resistance to corrosive agents is the most important feature, as they are not affected by salt water or moist air conditions. Although but slightly attacked by the organic acids found in foods, they should never be used as food containers, because of the poisonous nature of the small quantities of salts formed. Lead alloys are used mainly for cheaper bearings and such parts as small water pump vanes, counterweights, etc.



Numerous Machining Operations Were Eliminated by Die-Casting the Three Castings Shown—a Bracket Assembly of White Brass Castings



Six Separate Machining Operations Were Made Unnecessary by Die Casting the White Brass Gear Box Shown at the Right

Tin-base alloys are the most expensive and are used only where some other alloy would not do the work. They consist of tin alloyed with one or more of the following elements, in varying proportions: copper, lead, antimony, bismuth. A typical tin base alloy is that corresponding to S. A. E. specification No. 11, which consists of 5.75 per cent copper, 6.75 per cent antimony and 87.50 per cent tin. Tin base alloys, like lead, are somewhat soft but are considerably tougher. Their compressive strength usually runs from 12,000 to 20,000 lb. per sq. in. ultimate, and 4000 to 8000 lb. per sq. in. yield point. Their Brinell hardness range is from 15 to 30 and their specific gravity from 7.25 to 8.30. The use of tin base alloys is practically limited to food container parts and high-grade babbitt bearings; for the former, because of their resistance to all organic acids found in foods, and for the latter, because of the excellent anti-friction properties of tin base material.

Zinc-base alloys have been the most widely used for die-castings. They are composed of zinc alloyed with copper and tin or with copper and aluminum, in varying proportions. A typical analysis is copper 3 per cent, tin 6 per cent, aluminum 0.25 per cent and the remainder zinc. Another is copper 3 per cent, aluminum 4 per cent and the remainder zinc. Zinc base alloys are strong and in some cases tough, but in other cases brittle. Their tensile strength ranges from 20,000 to 40,000 lb. per sq. in., with from ½ to 2 per cent elongation. Their range of Brinell hardness is from 35 to 80 and their specific gravity from 6.20 to 6.85. A test bar ½ in. wide and 5/32 in. thick die-cast from these zinc alloys bends cold from 12 deg. to 90 deg. and supports a load on 3-in. centers of from 100 to 250 lb. This type test bar is used because it most nearly represents the average die-cast section of metal.

If improperly made, zinc base alloys are harmfully affected by moist air conditions, but if correctly made moisture and heat have practically no effect. They are used largely for automobile radiator caps, for instance, and when correctly made give no trouble. If, however, the alloys are not pure, the castings under the conditions of heat and moisture to which an automobile radiator cap is subjected swell and grow and finally disintegrate. The presence of heat and moisture is a factor which hastens this disintegration, since in ordinary atmospheric use nothing would be noticed except a warping and distortion. This phenomenon, however, does not occur in all zinc base alloys, but appears only in zinc alloys containing aluminum in the presence of other impurities. A reputable die-caster sees to it that no such combinations are produced in his plant. The fact that zinc die-castings have been used successfully for long periods of years in certain places calling for great accuracy, such as in delicate speedometer brackets, and have given no trouble, proves that correctly alloyed zinc base die-castings do not warp.

Aluminum-base alloys have been the latest alloys successfully die-cast and in this field a great future lies. They consist of aluminum alloys with one or more of the following elements in varying proportions: copper, silicon, zinc, nickel, manganese or magnesium. An alloy which is die-cast successfully and which has

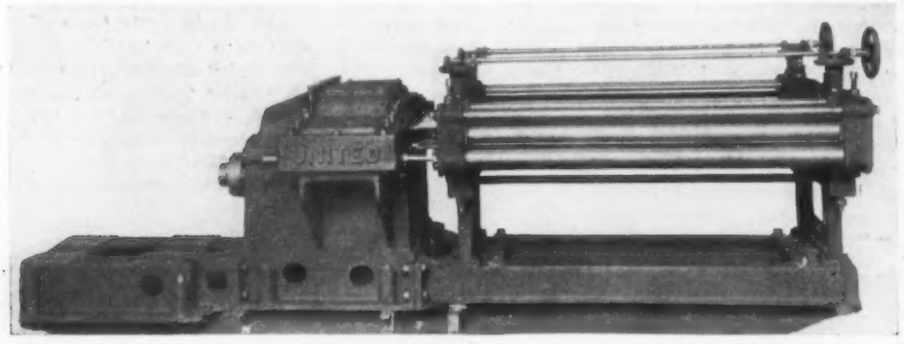
(*Continued on page* 1171)

*Metallurgist Stewart Mfg. Corporation, Chicago. This is the concluding portion of a paper presented before the Chicago Section, American Society of Mechanical Engineers. The first portion appeared at page 1052, issue of April 9.

Sheet Leveler with Fully Inclosed Drive

A new light plate straightening machine, or sheet leveler, capable of handling plates or sheets from No. 16 to ¼-in. gage, has been placed upon the market by the United Engineering & Foundry Co., Pittsburgh. Length of rolls and a new fully inclosed drive are notable features of the new machine, which is known as the model No. 2½ sheet leveler.

There are 15 straightening rolls, 4½ in. in diameter and 84 in. long in the body. These rolls are staggered and all are driven. The machine also has a set of pinch rolls at each end 5 11/32 in. in diameter, screw adjusted, the bottom pinch rolls being driven while the top ones run idle. The top straightening rolls are spring balanced, screw adjusted, and operate through bevel gears and hand wheel, moving as a unit. The two end rolls in addition are capable of independent adjustment and are separately spring balanced. The operation of these straightening rolls does not in any way affect the pinch rolls, which are independent. Roll bearings are bronze bushed and guides are provided between the pinch rolls and straightening rolls. The rolls are driven by a separate gear box through spindles seated on bronze shoes in jaws on the ends of the pinion shafts and rolls respectively, these spindles being readily removable.



THE Inclosed Drive Is a Feature. Both the gears and pinions run in oil and bearings are bronze bushed and separately lubricated. There are 15 rolls, which are 4½ in. in diameter and 84 in. long in the body. There is a set of pinch rolls at each end

The drive is an entirely inclosed unit, as shown in the illustration. The pinions are of forged steel and gears of cast steel, with cut teeth. Both gears and pinions run in oil which is poured into the pinion case, overflowing into the gear case where its level is controlled by a turn cock. The bearings are all bronze bushed and lubricated by separate wick feed oil cups. The pinions may be conveniently examined by the removal of the cover plate held in place by six bolts, while a similar arrangement gives access to the gear drive. The motor base, shown at the left, is of cast iron and is attached to the base of the gear case by a tongued and grooved joint and bolts. A 30 hp. 550 r.p.m. motor is employed. The delivery speed of the machine is about 60 ft. per min.

Detection of Flaws by Magnetic Analysis

The Bureau of Standards has been engaged for some time in a study of magnetic method for the detection of flaws and defects in steel, with particular reference to wire hoisting ropes. Many investigations along this line have been made at the bureau and elsewhere, but the uncertainty in the interpretation of results has hitherto been an obstacle to practical application.

Experiments have recently been made at the bureau to discover the cause of this uncertainty, and a method of eliminating it. It has been found that the greatest source of difficulty is the effect of variations in internal stress within the specimen. Such variations give rise to large differences in magnetic permeability, which produce effects similar to and often greater in magnitude than those caused by the flaws in the material. The results of recent experiments show that, by the use of higher values of magnetizing force than have heretofore been employed, the effect of internal stress is greatly reduced without a corresponding reduction in the effect of flaws. It thus appears that one of the greatest difficulties in the way of the practical application of this method has now been overcome. The experiments are being continued to determine whether or not sufficiently accurate interpretation of the results of magnetic exploration can be made to permit of its use as a practical inspection method.

Thermal Expansion of Aluminum and Aluminum Alloys

Data on the thermal expansion of four samples of aluminum and 51 samples of important aluminum alloys are given in Scientific Paper No. 497 of the Bureau of Standards. The preparation, chemical composition, heat treatment, etc., are included. Most of the specimens were examined in a range from room temperature to about 500 deg. C. Typical expansion curves of the various groups of samples are shown and discussed. In some cases, the data on expansion were compared with the equilibrium diagrams of binary alloys. After the expansion tests, the changes in length from the original lengths were determined.

A description of the apparatus used in this research and a review of the available information obtained by previous observers on the thermal expansion of aluminum and some of its alloys, are given.

The paper closes with a table showing the average coefficients of expansion of the materials investigated, over several temperature ranges. Copies are 15c.

Aluminum Taper Snap Flasks

Tapered flasks for snap molding, made from cast aluminum, have recently been put on the market by the American Foundry Equipment Co., New York. They are offered under the name of "cast aluminum taper snap flasks" and are claimed to overcome the weak features of the old style flask, such as liability to warp, strain, loosen and splinter. The adoption of solid corners instead of hinge-and-latch construction is pointed to as another advantage. For stripping the flask from the closed mold, the simple device of slightly tapering it has been adopted. Sliding steel sand strips, of special design for strength, form an interior supporting ledge for the cope sand on all four sides of the cope. When closing the finished mold, these sand strips are snapped outward by two projecting thumb pieces to release the flask from the mold. They have a positive automatic stop in either position, in or out, and cannot jar or fall out of position, nor do they clog the sand. When snapped outward the impression of the sand strips forms a useful venting channel all around the mold which conducts gases to the open corners of the pouring jacket. These flasks are a machine shop product, milled at top, bottom, corners and inside to special jigs. They are made in every inch of width and length from 10 x 10 to 20 x 24 in.

Will Loans Abroad Hurt Business?

European Practice of Making Loans Dependent Upon Purchase of Materials in Loaning Country Should Be More Generally Adopted

THERE is a danger that the large loans which have been and are being made to Germany and other European countries will react unfavorably upon the machine tool trade, said O. B. Iles* before the annual meeting of the Bankers' Association for Foreign Trade at Cincinnati, April 2. Mr. Iles said in part:

The announcement recently of a ten million dollar loan to the German Krupp organization by United States bankers, and almost immediately following this, announcement that the Krupps had taken over a big Spanish organization, including plants, mines, etc., and thereby had transferred large orders for machinery and equipment to German industries, has created considerable discussion among the executives of United States industries relative to the action of our bankers in making such loans, and has called attention to the destructive results to machinery and equipment manufacturers in the United States.

Compulsory Reciprocity

England, Germany, Belgium, France, Holland and other nations, which in the past have grown to be largely industrial, have had colonies upon which they depended for an outlet for the products of their manufacturing institutions. They have jealously guarded the interests of these manufacturing institutions within their borders, knowing full well that upon them depended their general prosperity.

Due to their form of government, the commercial and business interests of these other nations were able to enlist the active cooperation of all of the diplomatic representatives and commercial attaches, not only in the colonies, but also in all other countries. They have been able in the past and are now getting the cooperation of their bankers in addition to all diplomatic representatives in the interest of their industries and manufacturers and their welfare. When a railroad is built in China or Chile or India and English capital or German capital is used to finance this railroad, there is a clause in their agreement, making it necessary to spend the money for the material, machinery and equipment in England or Germany according to the source of the financial assistance. With the very close cooperation of the diplomats and attaches, these orders for machinery and equipment do come to the manufacturers of the country furnishing the finances.

The Banker's Obligation

No thoughtful banker in any community would knowingly finance an outsider whose intent was to wage a destructive campaign against the manufacturers and industries of his own community. The home banker would realize that by furnishing the means to disorganize and jeopardize the industries of his own community, he would injure himself far more in the long run than he would gain by the brokerage or commission from a loan made under these conditions. He would realize that he would jeopardize the progress of these home manufacturing industries and thus cut down the payrolls and increase the unemployment and materially reduce amount of money spent with the merchants, doctors, lawyers, churches, hospitals, amusements, charities and tax collectors. All business men thus affected would have less to deposit with him and would have less need for borrowing at his bank, and if extended far enough the bank might be involved with bankruptcy or liquidation proceedings that would mean severe financial loss.

The manufacturers of machine tools in the United States are willing to take their chance in competition with the manufacturers of machine tools in any country in the world, if they have an equal opportunity to get the business.

Due to the natural mechanical and designing ability of the machine tool engineers of the United States, backed up by the demand of manufacturers of metal products in the United States for rapid production machinery, the machine tool industries of the United States have developed rapidly in the last 30 years and are able to offer machine tools to the world that have no equal. They are willing to take the chance of presenting these facts to the prospective users of machine tools any place in the world and to show them that the productive and therefore monetary returns from their investment in machine tools made in the United States will be as valuable or more valuable than an investment in a machine tool made in any other country regardless of the initial price paid and regardless of the exchange rates and transportation costs to the various countries of the world.

Barred from Competing

But what does it avail a machine tool builder to be able to offer such inducements in China or in South America or South Africa, if when he approaches the prospective customer he is told "this institution is financed by a German, English, French, Belgian or Dutch financial institution and we are under written obligation to send all the business along the machine tool line to these countries." It is of no avail if at the start he is barred from competing.

What does it matter if there are economists who believe in what is called the "Triangular settlement of international transactions?" That is, if United States bankers furnish the Argentine with a large loan for industrial development, without any suggestions as to where they shall buy their machinery or equipment, the Argentine will, perhaps, place the order with Germany and then pay for it in wheat, Germany paying us in potash.

Value of Machine Exports

We believe that there is more value to the United States in the export of $1,000,000 worth of machinery or equipment than there is in the export of $1,000,000 worth of wheat or coal or raw material, for the reason that in the export of the raw material or the wheat, there is only the cost of its production. In the export of the machinery there is the cost of production of the raw material plus the refinement, the skill, the engineering ability and the labor necessary to manufacture this machinery or equipment. This is another reason why we think the bankers should have a thought for the industries and manufacturers' interests in the United States.

We think that there is an opportunity under the present conditions for the bankers of the United States to be of real constructive service to the manufacturers of machinery and equipment in the United States. When money is furnished to build and equip a railroad, have a thought for the welfare of the manufacturers of railroad equipment and machine tools in the United States. Insert a clause in the contract that this equipment be bought in the United Staes if possible and give all such manufacturers in the United States a chance at this business.

*President International Machine Tool Co., Indianapolis and president National Machine Tool Builders' Association.

Improves Crawling Tractor Crane

Split gears for propelling, increased speeds, double-clutch mechanism and other improvements have been incorporated in the 10-ton crawling tractor crane illustrated, which has been recently brought out by the Industrial Works, Bay City, Mich.

The system of split gears by which each tractor belt is separately controlled is perhaps the most important improvement. Two concentric vertical propelling shafts lead to two independent but concentric trains of spur and bevel gears, each operating one tractor belt. Each tractor belt is controlled by two friction clutches and brakes in the revolving upper works. Power is transmitted from the engine to the sprockets entirely by means of gears. The machine is thought to

Each Tractor Belt Is Separately Controlled, Which Facilitates Maneuvering in Close Quarters

be the only crawler crane which steers and propels through friction clutches, and also the only crane which has a friction clutch and band brake for each tractor belt. These features are stressed as facilitating maneuvering in close quarters.

Speeds of the motor-operated crane have been increased 25 per cent. A double-clutch mechanism by means of which the two slewing band clutches are operated by one lever, is intended to facilitate slewing. Direction of slewing may be changed by the movement of the slewing double clutch lever, reversal of the engine being unnecessary. The tractor belts are long, to provide stability when lifting over either end of the crane. The center distance between the two end sprockets is 10 ft.

The crane can be equipped to operate with a steam engine, electric motor, gasoline motor or fuel oil engine of the Diesel type. It operates with clamshell or dragline bucket, electro-magnet, hook and block or grapple, and any equipment that operates on a boom can be applied. It may be converted also into a shovel or pile driver. All functions are independent and the separate levers controlling each function are conveniently located in the revolving upper works. Provision has also been made for convenient maintenance.

"Statistics of the Iron and Steel Industries—1923" has just been issued by the National Federation of Iron and Steel Manufacturers, Caxton House, Westminster, London. It contains complete data of output of pig iron, steel, finished steel, imports and exports of iron and steel and covers the United States, Great Britain, France, Germany, Belgium, Luxemburg, Sweden, Italy, Spain, Poland, Canada, India and Australia. Copies can be obtained for 5s. 6d., postage paid.

Lebanon Drop Forge Shop Burned

The forge shop of the Lebanon Drop Forge Co., Avon, Lebanon, Pa., was destroyed by fire on the morning of April 8. The loss is estimated at $80,000. Machine shop and office building of the company were not damaged. The forge shop will be rebuilt with steel construction. The fire started in the roof, over a furnace which served a 4000-lb. hammer. Company employees manned fire apparatus, but the water pressure was so low that nothing effective could be done to save the shop in the face of a stiff wind that was blowing. One end of the shear shop was also damaged. Local fire companies devoted their efforts to saving the remainder of the property. The plant was busy and about 35 men will be thrown out of work for the time being. Loss is covered by insurance.

Dr. Benedicks on High-Speed Steel

An authoritative address on the "Nature of High-Speed Steel" will be delivered before the New York Chapter of the American Society for Steel Treating, Friday evening, April 17, by Dr. Carl Benedicks, director of the Metallographic Institute, Stockholm, Sweden. He was to have delivered this lecture before the chapter on Feb. 11, but, owing to the delay of his steamer, he did not arrive in time. The meeting, which will be held in the assembly room of the Merchants' Association, Woolworth Building, is the regular April meeting of the chapter, held usually on the third Wednesday of the month. Dr. Benedicks is just completing an extensive lecture tour in this country.

Two New Types of Metal Slitting Saws

Two slitting saws, one of which is for cutting soft metals such as copper, brass and bronze and the other for use on connecting rods and other drop-forged steel parts, have been added recently to the line of the National Twist Drill & Tool Co., Detroit.

In the tool for slitting or cutting metals of soft or spongy nature, shown in Fig. 1, the teeth are cut radial and the sides are ground concave. Alternate teeth are ground with a 45 deg. bevel on each side, as shown at *a-a*, the other teeth being plain, as at *b-b*, an arrangement intended to distribute the cut per tooth and break up the chips. The large radius between the teeth prevents chips from clogging, which is the tendency of soft materials, especially in deep slots.

The so-called connecting-rod type of slitting saw is shown in Fig. 2. In this tool the teeth are undercut having a rake angle of approximately 7 to 10 deg., and the sides are ground concave. Teeth *a-a* and *b-b* are ground with a 45 deg. bevel on each side but in a staggered relation to each other. Tooth *c-c* is ground with

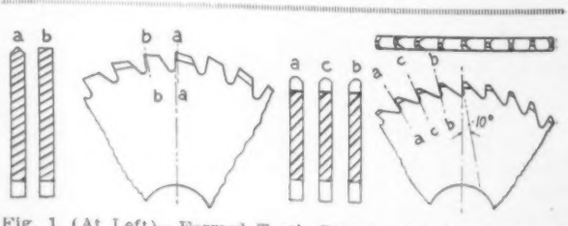


Fig. 1 (At Left)—Formed Tooth Saw for Slitting Soft and Spongy Metals. Fig. 2—Saw for Slitting Connecting Rods and Other Drop Forgings

45 deg. equal bevels on each side of the tooth. This beveling is stressed as preventing the chipping and breaking of corners, and the staggered effect of the teeth is claimed to break up the chips and permit of taking a deeper cut than if the tooth were plain.

The British Empire Steel Corporation, Sydney, N. S., established a new record production at its open-hearth furnaces during March, the total output being 35,013 tons, which compares with the previous record of 34,279 tons, made in May, 1924.

Characteristics of Industrial Floors

Factors to Be Considered in Selecting a Floor—Methods of Preventing Decay—Adaptability to Loads and Machine Weights

BY H. K. FERGUSON AND B. R. MAGEE*

BECAUSE of its importance in the construction and the maintenance of a factory, the question of proper flooring has become one of the most vital to be considered by the prospective owner of an industrial plant.

Points of fundamental importance to the builder or owner are as follows: First cost, probable life under actual service conditions, ease and cost of replacement and repair, comfort to employees, effect on their general efficiency, and the yearly cost based on all the above considerations.

From the design and construction standpoint the essential factors are: Weights of materials to be handled, type of trucks to be used, width and kind of truck wheels (whether rubber or iron), weights and locations of machinery and other movable or live loads, rigidity required for machinery, and all facts regarding acids, alkalies, oil, water or other fluids used in the manufacturing processes which are apt to be spilled on the floor.

In general, a floor consists of two parts of equal importance: The structural or sub-floor, and the wearing surface or finish. In determining the type of wearing surface to be used it is also necessary to consider the structural floor, as combinations of the two are limited. For this reason a description will be given of various combinations, with their usual advantages and limitations, beginning with the least expensive and leading up to the most expensive for each type. It is important to remember, however, that local prices of materials may change the order of sequence in some cases, and the only sure way to get the facts is to take figures from some reliable builder.

In the single-story type of industrial building, which has come into very general use in recent years, the main floor is generally placed directly on the ground or fill. Dampness promotes fungus growth and rotting; it also causes serious warping and buckling of wood floors. Settlement is damaging to nearly all types of floors, but particularly so to concrete.

Filling

Where a fill is necessary to bring the grade to the required level or to raise the grade on account of dampness, use sand, if obtainable, slightly dampened and thoroughly packed. Cinders are often used for this purpose, but should not be placed around iron piping or structural steel, due to the presence of free alkalies. A further objection where concrete is to be poured directly on the fill lies in the fact that part of the cement is lost by capillary attraction of the cinders, and this materially weakens the concrete slab. Clay filling is not as satisfactory as either sand or cinders since it generally settles more unevenly.

Clay Floors

A clay floor is soft, resilient, easy to walk on, and is particularly adaptable to foundry work, where ladles, flasks, etc., are handled by an overhead carrier system. It should be put down in layers of from 2 to 6 in., depending on the stiffness of the clay, to a total thickness of about 12 in. Where surface water is present the sub-soil should be thoroughly tiled. To prevent dusting, the surface may be sprinkled with sand, and in order to maintain the floor in a level condition it should be scraped and rolled once or twice a year, as conditions require. Clay floors are not adaptable for heavy trucking.

Floors consisting of a stone-concrete base and either cement or special finish have been used with fairly satisfactory results in many industries. The chief objection to floors of this type is that they are cold and hard, causing cold feet and leg weariness of employees. They also have a tendency to dust and wear in spots. When properly constructed, however, concrete floors are comparatively cheap in first cost and quite satisfactory for general purposes.

The structural concrete slab is usually poured in either a 5 or 6 in. thickness and should never be leaner than a 1-3-5 mix. It should be reinforced with wire mesh or rods where there is a possibility of any settlement of filling materials below the slab or where the sub-soil may become soft during the wet season.

Cement Finish

Either a monolithic finish or a topping of 1 in. cement and sand (1-2 mix) may be applied for ordinary purposes. Except under good weather conditions and when under cover and protected from frost it is difficult to obtain a good monolithic finish. Such a surface is also more difficult to repair than a separate topping, but has the advantage of a perfect bond to the structural slab. The addition of limestone screenings will very materially increase the hardness and life of the floor.

The finish should generally be laid with a smooth surface, as experience has shown that excessive wear generally results at the markings if the floor is blocked off into squares. Of course, this would not hold for office or garage display rooms or other space where improved appearance is desirable and the usage is light.

Liquid Floor Hardeners

Sodium silicate has been successfully used on concrete floors and roadways (in Ohio) as a top dressing to cure dusting and waterproof the cement. However, common viscous waterglass is not always satisfactory. The most generally useful silicate for use on cement has a ratio of 3.3 molecules of silica to 1 of soda and is usually clear.

There are a number of patented liquid hardeners on the market which have given satisfactory results and special paints have been developed for use on concrete surfaces. Painting is especially to be recommended where color treatment is wanted. It also effectively prevents dusting and renders the surface impervious to water.

Calcium Chloride

The Illinois Division of Highways has made a series of very exhaustive road tests in the use of calcium chloride and have found that 2¼ lb. of the flaked chemical per square yard takes the place of the usual curing by the earth and water method and saves about 14 days in the curing period required. Tests also show the ratio of wearing resistance of treated and untreated concrete specimens to be about 10 to 1. There are no floors installed in this manner to our knowledge, but the method is worth consideration as a time-saver and also as a surface hardener if the Illinois tests are borne out in facts.

Metallic Floor Hardeners

Where the floor is apt to be subjected to abrasion, such as the dragging of heavy objects over it, either

(*Continued on page* 1169)

*H. K. Ferguson Co., Cleveland.

METAL TRADES MEETING

Convention to Be Preceded by Conference with Agriculturists

Cleveland Meeting Will Consider Industrial and Economic Problems—President Paul C. De Wolf to Be Re-elected

The twenty-seventh annual convention of the National Metal Trades Association, to be held at the Hotel Cleveland, will be confined to one day, Wednesday, April 22, but, as stated in THE IRON AGE last week, the convention will be preceded on Tuesday by the third conference of farmers and manufacturers.

Secretary Jardine of the United States Department of Commerce is expected to be present at the conference, but if he should not be able to attend he will be represented by his chief assistant. Governor Carey, chairman of the President's Agricultural Commission, is also showing great interest in the meeting and O. E. Bradfoot and L. J. Taber, both of Ohio, and members of the commission, will be in attendance. The conference program will open at 11 o'clock in the morning, when the message of the president of the association will be read. Others who will speak are W. J. Thompson, chairman executive committee of the National Grange, and C. A. Dyer, master of the Grange for the State of Ohio, who will have charge of the afternoon session, which is to be devoted to the subjects of reparations and taxes. These subjects form a common ground for an interchange of ideas upon which plans for a more complete, forward-looking and generally established relation between agriculture and industry may be built. The conference is an indication of the desire of leaders in the metal trades industry to encourage legitimate cooperation between the business man of the city (the manufacturer) and the business man of the country (the farmer) in matters affecting the welfare and prosperity of the nation.

The N. M. T. A. Program

The convention of the National Metal Trades Association will be opened Wednesday morning by an invocation by Rev. Dan F. Bradley, pastor of Pilgrim Congregational Church, Cleveland, and the address of welcome will be delivered by Hon. W. R. Hopkins, city manager, Cleveland. After the reports of President Paul C. DeWolf and Treasurer John W. O'Leary are read, reports of committees will be heard and addresses will be delivered by Hon. O. L. Smith, Assistant Attorney General, State of Michigan, Detroit, who was prosecutor of Reds at Borden, Mich., and W. J. Thompson, chairman National Grange Executive Committee, South China, Me.

At the afternoon session addresses will be delivered by Louis Ruthenburg, Yellow Sleeve Valve Engine Works, Moline, Ill., on "Training, Developing and Promoting Foremen," and R. W. Boyden, president Boston Chamber of Commerce, Boston, and unofficial observer for the United States at meetings of the Reparation Commission, who will speak on "International Debts." The only point on which there is still doubt is whether Frank A. Scott, president Warner & Swasey Co., Cleveland; Col. Leonard P. Ayers, vice-president Cleveland Trust Co., or D. C. Wills, chairman of the board of directors Federal Reserve Bank of Cleveland, will deliver an address on "Present Day Business and Its Outlook."

The Banquet Speakers

Hon. John C. Barrett, who will be the principal speaker at the banquet Wednesday evening, is recognized as an international trade expert with long experience in world affairs, having been United States Minister to South American and Asiatic countries and Director-General of the Pan-American Union, as well as special commissioner to various foreign countries. He is now chairman of the International Pan-American Committee. The other speaker at the banquet will be Lieut. Leslie P. Arnold, who won fame as one of the American flyers who circled the world in an airplane.

Officers Nominated

Officers of the National Metal Trades Association nominated for the coming year are as follows: President, Paul C. DeWolf, Brown & Sharpe Mfg. Co., Providence, R. I.; first vice-president, Paul T. Norton, Case Crane & Engineering Co., Columbus, Ohio; second vice-president, Harold C. Smith, Illinois Tool Works, Chicago; treasurer, J. W. O'Leary, Arthur J. O'Leary & Son Co., Chicago; councilors for coming two years, W. W. Coleman, Bucyrus Co., South Milwaukee, Wis.; E. J. Miller, St. Louis Screw Co., St. Louis; S. C. Biggert, Jr., United Engineering & Foundry Co., Pittsburgh; Frank Collins, National Supply Co., Toledo; Thomas W. Pangborn, Pangborn Corporaton, Hagerstown, Md.; J. G. Benedict, Landis Machine Co., Waynesboro, Pa. Alfred Kaufmann, Link Belt Co., Indianapolis, was nominated councilor to fill the unexpired term of Frederick Fosdick, diseased, Fitchburg Steam Engine Co., Fitchburg, Mass. Justus H. Schwacke, Wm. Sellers & Co., Inc., Philadelphia, remains an honorary councilor. The executive committee is unchanged.

New England Foundrymen Addressed by Dr. Moldenke

Dr. Richard Moldenke, Watchung, N. J., was a guest of the New England Foundrymen's Association, Wednesday evening, April 8, at the Exchange Club, Boston. Dr. Moldenke talked on defective castings and their elimination, following which he answered numerous questions, and closed with a sketchy synopsis of his recent trip abroad.

His talk on defective castings was general, embracing the many causes and giving one or more reasons for defections in each instance. He said: "There is no such thing as a sound casting. We will probably never reach it. All we can do is to reach the nearest point to it."

The more than 100 foundrymen present were urged by Dr. Moldenke to tabulate their foundry troubles and rectifications so that they may all obtain the benefit of these corrections. He feels that there is room in every foundry for two bright young men, one in the sorting room and one on the cupola charging floor. A very large percentage of defective castings in the average foundry, in his opinion, is based on cupola troubles, and two such young men can correct many of the troubles. Dealing with the question of mechanical cupola charging Dr. Moldenke feels it cannot be profitable except when 40 tons or more are melted daily.

In connection with his trip abroad Dr. Moldenke said that Norway and Sweden jointly are doing a very excellent thing. They maintain a special practical foundryman who goes the rounds of the foundries to help iron out any troubles, and to call meetings of foundrymen for the purpose of discussing general topics of mutual interest.

At a brief business meeting prior to Dr. Moldenke's address, the Draper Co., Holyoke, Mass., was admitted to membership in the association. It was announced that the May meeting will be given over to brass melting, castings, etc. Representatives from 12 brass foundries have signified their intention of having something to say about the industry. In addition, there will be an interesting address on pyrometers. R. F. Harrington, president of the association, presided.

Orders received by the General Electric Co. for the quarter ended March 31 amounted to $83,846,236, compared with $73,487,903 in the same quarter of 1924, according to an announcement by President Gerard Swope.

Metallurgical Research in England*

Experimental Foundry and Small Rolling Mill Aid Research at National Physical Laboratory —Investigations in Progress

BY DR. WALTER ROSENHAIN

FROM its beginning, metallurgical research at the N. P. L. has always aimed at the close correlation of the physical and mechanical properties of alloys with the study of their constitution. For this purpose, however, it is necessary to prepare the alloys in relatively large quantities, not only as ingots and castings but in wrought forms such as bars, rods, sheets, etc.

An Experimental Foundry

Equipment for work of this kind on a reasonable experimental scale has been provided at the N. P. L. in the form of a foundry or melting shop and an experimental rolling mill. A general view of the foundry is shown in Fig. 9; it is equipped with a series of gas-heated crucible melting furnaces sunk in a pit and provided with both high and low pressure air and suitable flues. There are also two rather larger recuperative gas-fired natural draught furnaces of a type designed and constructed at the laboratory, which are used partly in connection with researches on glass and partly for the firing of refractories, including special crucibles, thermocouple protectors and other refractory products required for experimental research.

The facilities for producing articles of this kind constitute an important asset to the metallurgical research resources of the laboratory since, in many cases, similar products could not be obtained in any other way. A particularly striking example of the value of this side of the work has quite recently been provided by a research on the relations of oxygen to pure iron (iron—iron-oxide system) in which it was necessary to hold molten oxide of iron for some time in contact with molten iron. No available crucible would answer for this purpose until a special type of electrically fused magnesia crucible was developed and made in the laboratory.

In addition to the gas-fired furnaces, the foundry is equipped with a range of electric furnaces. These include a Morgan tilting electric crucible and a number of special "graphite ring" furnaces, which have been developed in the laboratory. Alternating current supply and an adjustable heavy-current transformer capable of handling currents up to 10,000 amperes are provided for this work. The latest addition to the furnace equipment is a 25-kva. Northrup high-frequency induction furnace which, in spite of the many difficulties attaching to its use, is none the less proving very valuable, particularly where metals have to be melted in a good vacuum and in the absence of all possible sources of contamination. Apart from this latter type of furnace, the foundry equipment is capable of producing castings, ingots and slabs weighing up to 80 or 100 lb., and facilities for both sand and chill casting are provided.

The Small Rolling Mill

For the purpose of studying the forging and rolling properties of alloys and of investigating their mechan-

*Concluded from THE IRON AGE, April 2, at page 975.

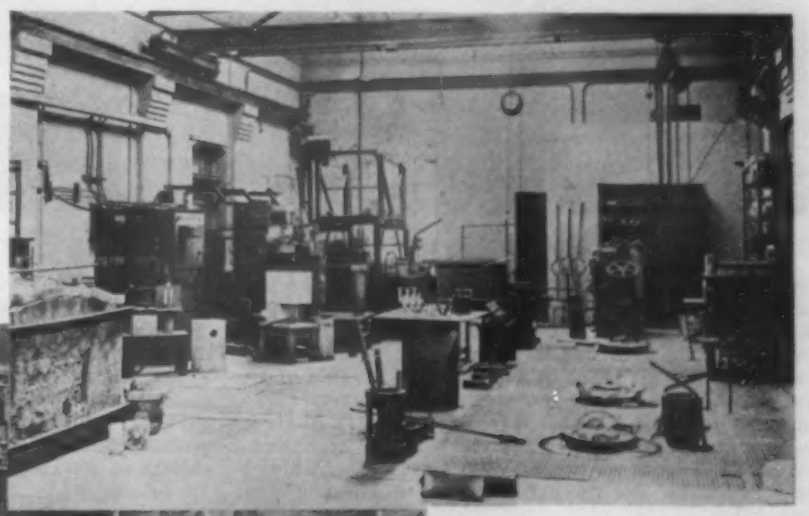


Fig. 9—The Furnace Room or "Foundry." (Right) In the foreground on the left is a recuperative coal gas-fired furnace attaining temperatures above 1600 deg. C., used for melting and for firing refractories. Next to it is an Ajax-Northrup high-frequency induction furnace. On the right is a Morgan tilting electric crucible and a row of small metal melting crucible furnaces (gas-fired) sunk in a pit. A 3-ton traveling crane is provided

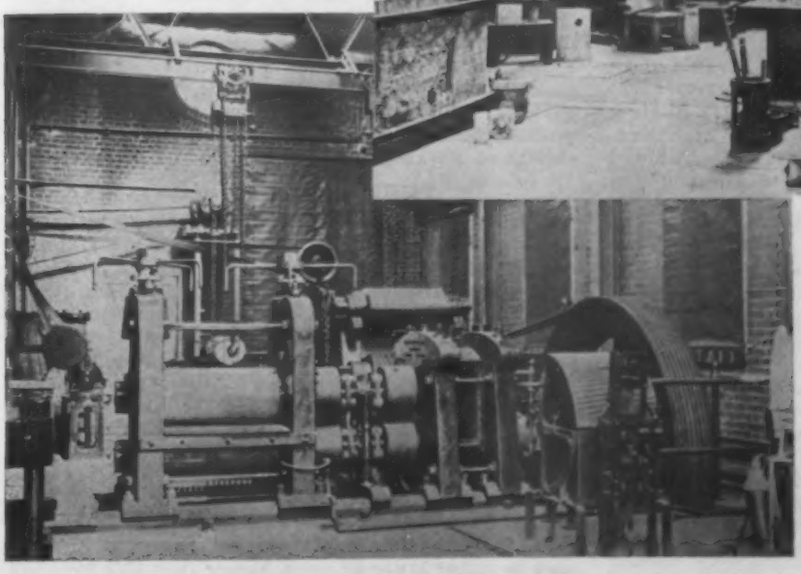


Fig. 10 (At Left) The Experimental Rolling Mill. This is an electrically driven two-high non-reversing mill; sheet-rolling rolls are shown in position but grooved rolls can be fitted. An 80-ton hydraulic press and two forging hammers are provided. Materials ranging from steel to aluminum alloys, copper and bronzes have been rolled in this mill. Pre-heating furnaces providing temperatures from 200 up to 1300 deg. C. are provided (not shown)

ical properties in the rolled condition, an experimental rolling mill equipment is provided in a separate building shown on the plans of Fig. 1. The interior of this building is illustrated in Fig. 10. The main item of equipment is a 2-high, non-reversing mill having rolls 2 ft. 6 in. wide and 15 in. in diameter, driven by an electric motor of 60 kw. power, but capable of withstanding heavy temporary overloads. Both plain and grooved rolls are provided, and it is found that the mill can be successfully used both for the cold rolling of the harder bronze alloys and for hot rolling of steel. Suitable heating furnaces, both electric and gas-fired are provided, as also two forging hammers, one of the spring type, the other pneumatic. A small hydraulic press (80 tons) and circular saws and other accessory appliances are also available.

When the installation of an experimental plant of this kind at the N. P. L. was first suggested, it was urged that work of this kind would be better and more cheaply done in industrial plants, particularly as the behavior of alloys could then be studied "under works conditions." Actual experience, however, had already shown the extreme difficulty of carrying out rolling experiments on such lines. Industrial plants had been most freely and generously placed at the disposal of the research workers engaged, for instance, upon the preparation of the ninth and tenth reports to the Alloys Research Committee, yet the results were disappointing. With the best will in the world, a manufacturer cannot modify his plant to suit the requirements of an experimental alloy and, frequently, the effort to adapt an alloy to make it suitable for treatment in existing industrial plants stultifies the result aimed at. Occasional exceptional results, whether good or bad, cannot be followed up, and the data obtained are thus of limited value.

In the experimental mill in the laboratory, on the other hand, all the anomalies of behavior can be followed up, suspected variables eliminated and definite conclusions reached. Thus at Teddington it was found possible to work out methods of forging and rolling certain aluminum alloys which, formerly, had been regarded as casting alloys only. When these methods had been demonstrated to works managers, they were able to reproduce in their plants the conditions established in the laboratory and thus to achieve industrially what had previously been regarded as impossible. It is not too much to say that the more important achievements of the N. P. L. on the practical side of non-ferrous metallurgy in particular could not have been attained without the aid of the experimental rolling mill.

Before leaving the subject of the buildings and equipment of the department, mention must be made of the chemical laboratories attached to it. One of these is illustrated in Fig. 11, and their location is indicated on the plan of Fig. 1. A very large amount of metallurgical analysis is carried out here, including much work of a very special and difficult character, as, for instance, the accurate determination of oxygen in "alloys" of pure iron and oxygen, or the estimation of small quantities of impurities in samples of some of the rarer metals. In addition, a certain amount of regular analytical work on steel and other metals is undertaken for certain government departments, although routine analytical work for private firms or individuals is entirely excluded.

Research Investigations

In the course of the somewhat sketchy description of the buildings and equipment of the metallurgical laboratories at the N. P. L., which has been given above, incidental mention has been made of a few of the researches which have been carried out there, such as the extensive work on aluminum alloys and the current researches on the alloys of iron. Even a brief outline of all the researches now in progress would occupy too much space to be given here. They include both "pure" research, initiated by the laboratory for the direct advancement of metallurgical knowledge and of physical science generally, and numerous researches of a less academic kind, undertaken for the direct or indirect solution of industrial problems, while other lines of work include the investigation of specific works problems and of important cases of failure in metal objects of all kinds.

Fig. 11 — Large Chemical Laboratory, Used Mainly for Steel Analysis. Roof lighting from the north is used, the shed roof being carried on wooden trusses and provided with white-enameled wood lining. A large ventilating trunk runs along the left side of the room, providing for a series of fume chambers. On the bench at the end are the combustion furnaces for the direct determination of carbon

Plastic Strain and Fatigue

Under the first heading come investigations on the behavior of metals under plastic strain and fatigue, and the study of the internal structure of metals in relation to the space-lattice arrangements of the atoms. With regard to strain and fatigue, important results are being obtained which, while they may perhaps render some of the older theoretical views less acceptable, yet throw important new light on these problems and are steadily leading toward the formulation of newer and sounder ideas on the subject. Thus it was for a long time supposed that stresses lying well within the "elastic" range of a metal as determined by ordinary extensometer measurements could not lead to fatigue failure, however long repeated. Modern results, however, show that the real "fatigue" range of a metal may be either lower or much higher than this so-called

"elastic" range. Much of the work on this subject has been done in the engineering department of the laboratory by research workers provided with a splendid equipment of machines designed for carrying out tests of this kind. The cooperation of the metallurgy department has, however, been of fundamental importance and will, it is hoped, lead to further progress in the elucidation of this difficult and important problem.

Pure Products and Physical Constants

Among other matters under investigation are the production of pure metals and alloys for the re-determination of their physical constants. Text-books on physics and works of reference contain numerous data about such matters as specific heat, latent heat or fusion, thermal and electrical conductivity, etc., derived from measurements made on materials whose real nature is not accurately known, since they were often of unknown origin and had not been studied from the metallurgical point of view in regard to purity of composition and the treatment which they had undergone. The metallurgy department of the N. P. L. is therefore engaged in the preparation of metals and alloys of the highest possible purity and subjected to standard and clearly defined thermal and mechanical treatment, and these specimens of metal will be used for accurate physical determinations in the physics and electrical departments of the laboratory.

Impurities in Copper

Not far removed from this line of activity is an investigation, now in progress on behalf of the British Non-Ferrous Metals Research Association, on the effects of impurities on copper. Results of the work on oxygen and on iron have already been released for publication and it is hoped that further publications will follow as the work progresses, although the results are first communicated for the information and use of the members of the research association.

Other problems being investigated for the same association include the determination of oxygen in aluminum and the study of special "high-tensile" brass alloys, as well as a research on the die-casting of aluminum alloys. In quite other directions work is in progress, on behalf of the dental investigation committee of the Department of Scientific and Industrial Research, on dental alloys and amalgams—a piece of work likely to entail the polishing and microscopic examination of these materials at temperatures far below zero, since many of these alloys are partially liquid at room temperatures.

These items, taken from a long list of investigations in progress, must be regarded as typical examples. Of a number of items of research work in progress, no mention is possible here, since they are of a confidential nature, being carried out either for government purposes or for individual industrial firms. In the latter class of cases, the work and its results are regarded as entirely confidential to the firm in question, but that firm bears the entire cost of the work. While not leading to publication or to any public recognition, this type of work has served not only to keep the research staff of the laboratory in the closest touch with industrial requirements and developments, but has also secured the confidence and ready cooperation of a large section of British metallurgical industry.

The account of the metallurgical department of the N. P. L. which has here been attempted is, unavoidably, incomplete and inadequate. It is hoped, however, that some impression of the nature and range of its work and of the extent of its equipment has been given. From very small beginnings, this laboratory has developed until today it may well claim a place among the leading metallurgical laboratories of the world. Even yet, however, it is able to fulfill its functions only to a limited and incomplete extent so that there is not only room but there is also much need for further development.

Program for Mechanical Engineers' Spring Meeting

More than 36 papers will be presented at the 13 sessions of the spring meeting of the American Society of Mechanical Engineers, to be held in Milwaukee, May 18, 19, 20 and 21. Among other activities planned are excursions to several manufacturing plants.

At the machine-shop session, to be held Tuesday morning, May 19, papers on "Recent Investigations in Turning and Planing, and a New Form of Cutting Tool," by H. Klopstock; "A Code of Design for Mechanical Springs," by J. K. Wood; and "Defects in Large Forgings," by J. Fletcher Harper, will be presented. There will be sessions on hydroelectric plant design and operation, forest products, and pulverized coal. Papers to be read and discussed at the latter include "A Microscopic Study of Pulverized Coal," by L. V. Andrews; "Radiation in the Pulverized Fuel Furnace," by W. J. Wohlenberg and D. G. Morrow, and "Boiler Furnaces for Pulverized Coal," by A. G. Christie. Excursions will be made on Tuesday afternoon to the works of the Allis-Chalmers Mfg. Co. and the Kearney & Trecker Corporation. The powdered fuel plant of Elines, Inc., chocolate manufacturer, will also be inspected. A visit to the Central Continuation School is planned for the evening.

"The X-Ray Examination of Steel Castings," a paper by I. E. Moultrop and E. W. Norris, will be read at a session on Materials, which is scheduled for Wednesday morning. "Aluminum and Its Light Alloys" will be discussed by R. L. Streeter and P. V. Faragher, and "Stress Concentration Produced by Holes and Fillets," by S. Timoshenko and W. Dietz.

Papers of broad interest are planned for the materials handling meeting, which will also be held Wednesday morning. "Formulas for Computing the Economies of Labor-Saving Equipment," a paper by J. A. Shepard and G. E. Hagemann, will be followed by another on "An Application of the Formulas for Computing Economies of Labor Saving Equipment," by George Langford, Jr. "The Economic Efficiency of the Full Automatic Turret Lathe in Comparison with the Semi-Automatic Turret Lathe" will be discussed by R. J. Ward at the same session. Papers at a simultaneous meeting on industrial power will include "Torsional Vibrations and Critical Speeds of Shafts," by A. Lack, and "Tests of a Uniflow Engine," by G. H. Barrus. On the invitation of the War Department and the American Society of Mechanical Engineers the manufacturers of Wisconsin will meet Wednesday morning to go over the industrial preparedness plans in Wisconsin based on the allocation of materials to be manufactured in that district. Wednesday afternoon is to be left open for visits to the plants of the Falk Corporation, the Vilter Mfg. Co. and the Riverside pumping station, and at night Assistant Secretary of War Davis will be the principal speaker at the public meeting following the dinner.

Management topics will be discussed at one of four simultaneous sessions on Thursday morning, May 21. Data on "Steel Foundry Management" will be given in a paper by R. A. Bull, and G. P. Fisher will present a paper on the "Management of Gray Iron Foundries." Harold S. Falk will speak on "A National Apprenticeship Program," and it is planned to have a paper on the Milwaukee district apprenticeship scheme.

"Freight-Car Maintenance," by C. G. Juneau, will be one of the papers at the railroad session, and "A Review of Steam-Turbine Development" is one of four papers at the meeting on steam power. Excursions planned for Thursday afternoon include a visit to the Nordberg Mfg. Co.

"The Analysis of Fuel Gas" is the title of Circular No. 12 of the engineering experiment station of the University of Illinois, Urbana, Ill. The authors are S. W. Parr and F. E. Vandaveer.

LOWER PRODUCTION RESTORING EQUILIBRIUM

1. Consumption, although it has lagged behind production, has held up well and current activity in railroad transportation indicates continued large use of iron and steel.
2. The trend of iron and steel output is definitely downward indicating a closer balance between production and consumption.
3. The March decline in unfilled steel orders was partly seasonal, and leaves the total volume larger than at the end of 1924. It indicates the present tendency to liquidate stocks and to limit orders to nearby requirements.
4. Small declines in the average price of iron and steel occurred in March.

BY DR. LEWIS H. HANEY
Director, New York University Bureau of Business Research

Stocks and Production Reduced; Consumption Still Satisfactory

OUTSTANDING in the iron and and steel market recently is the tendency of consumers to liquidate stocks. Sagging markets make inventories undesirable.

The result of the tendency appears in the shape of moderate specifications on contracts and small buying for future requirements. The disappointing demand for secondary products, which was referred to in this section last month, is now reflected in the markets for basic materials. The tendency to buy from hand to mouth and to reduce inventories has caused dullness and weakness in the markets for pig iron, scrap, and coke. Billets, too, after a period of firmness, have declined.

Continued dullness and moderate declines in iron and steel prices may last for another month or two. Indeed, no heavy buying is anticipated for the second quarter.

What is going on is a process of readjustment in the production schedules which will ultimately bring the output of iron and steel into line with the consumers' requirements, and the second quarter will be one in which a new and sounder level of production and prices will be established.

The most hopeful phase of the situation lies in the fairly satisfactory level of consumption. Automobile production is still maintained and the March output of cars and trucks is reported to have been 29 per cent greater than in February. The demand from railroads continues rather satisfactory and the same may be said of the petroleum industry. The least satisfactory phase of the market seems likely to come in the case of building and exports. The general trend of building activity appears to be downward.

The reason for the readjustment lies in the fact that for three months the steel mills have been running at over 90 per cent of capacity, while consumption has probably been at a rate not much over 75 per cent. Under the circumstances stocks have accumulated in one form or another. The probable results will be (1) a decrease in production during the second quarter, and (2) continued ease in prices. With consumption holding up as well as now seems likely, however, a more normal balance should be restored in a relatively short time.

The accumulation of stocks referred to appears to be chiefly in the hands of jobbers and consumers. No large accumulations are reported at mills, except possibly in the case of sheets.

The fundamental fact is that the monthly production of steel ingots has been in excess of the line of normal trend, or line of theoretical needs. *Progress toward readjustment is indicated both by the fact that in March steel production moved downward toward the normal level and by the fact that the rate of pig iron production on April 1 was nearly 3 per cent less than the rate on March 1.*

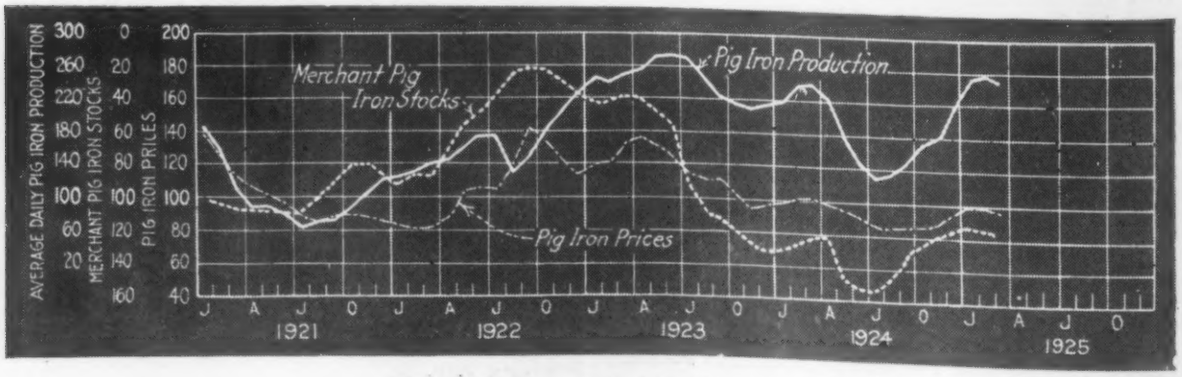


Fig. 1. Pig Iron Output On Downgrade

The production curve is the average daily production of pig iron with seasonal variations eliminated. The price curve shows the trend of THE IRON AGE composite for pig iron

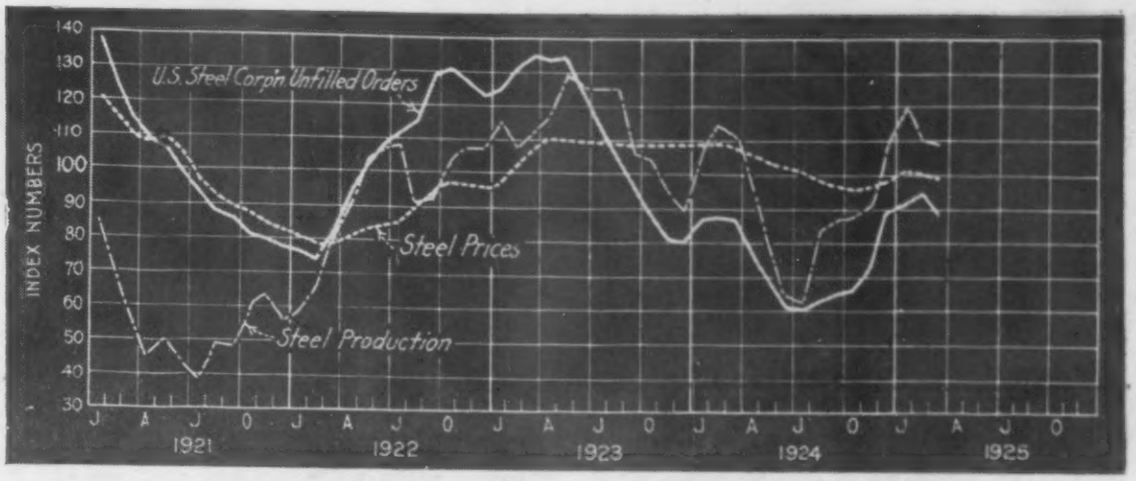


Fig. 2. Steel Production Drops to Restore Parity With Consumption

The price curve represents the movement of THE IRON AGE composite index of finished steel. The production curve represents the true trend of ingot output, based on American Iron and Steel Institute figures. The unfilled orders are those reported by the United States Steel Corporation

Steel Output Still Above Normal; Decline Gradual

IN March the steel ingot output continued to show the decreasing trend which began in February. The word "trend" is used for the reason that the preceding statement is based on an allowance for seasonal variation. The actual total production of ingots in March was higher than in February. But it is usual for March to show an increase over the preceding month of about 12 per cent, and a gain of that amount means nothing but the normal seasonal rise. In the month just closed, the increase was less than normal, and consequently the adjusted index shown in Fig. 2 declined from 110.4 in February to 109.4.

The real peak of steel production, therefore, occurred in January. The January peak, however, was not so high as that reached in May, 1923. Moreover, the subsequent decline has been more rapid. These facts make it seem rather probable that the recession which is now under way will be more moderate than that which occurred about twenty-two months ago.

The curve of steel ingot production still lies above the line of normal trend—steel production is abnormally high. But *present indications are that production will fall back toward normal rather gradually during the second quarter and stabilization will be attained without much disturbance and without production swinging very far below normal.*

The Steel Corporation's unfilled orders at the close of March showed a decline of over 421,000 tons. A part of this decline was merely seasonal. Making due allowance for this factor, the March decrease was considerably smaller than that of April, May and June last year. The volume of unfilled orders is larger than at the end of December, 1924, and exceeds any month last year except February and March.

The March average of THE IRON AGE composite price of finished steel fell below the February figure, which makes the second successive decline in the monthly average. This brings the price index to about the average level of 1921.

There is nothing in sight to give great firmness to steel prices. Any decline should be very moderate in view of the fairly satisfactory level of consumption and the position of unfilled orders.

A little study of the graph (Fig. 2) will probably suggest that the curves as shown therein give evidence of the tendency to stabilize in the neighborhood of the 100 per cent line—which represents the 1921 average for steel prices and unfilled orders and the normal trend of steel production.

Lower Pig Iron Output Aids Price Stabilization

THE March average daily production of pig iron at 114,975 tons was up slightly from February, but the increase was so small as to justify the statement that the average daily rate for the month was practically unchanged. Usually in March pig iron production increases about 4 per cent. The failure of the average daily production to increase by this amount, therefore, means that the production was less than it would have been under normal conditions.

This is the first reduction in the adjusted monthly average since July, 1924. The rate of production is now about the same as in August, 1923. Iron production is little, if any, above the normal trend, but evidently it has been too high with relation to steel production and to the present rate of consumption.

One of the most hopeful signs of an improvement in business fundamentals is the correction in the over-production of iron which is now under way. The output of iron has been checked even more decidedly than in the case of steel, which is well.

The pig iron output, however, is still too great, and continued weakness in the price of that product is to be expected. *The point here made is that the rather prompt curtailment, coupled with good consumption, and a moderate good general business outlook, indicate that only moderate recessions in price are to be expected.*

Stocks of merchant pig iron which in the past have furnished an excellent barometer are not available in published data. They must still be large—probably larger than in January. This fact is an element of weakness in the situation. Those who have access to the data should follow them closely for any indication of a decrease, for such a move will probably mark the approach of a firmer market.

The monthly average of THE IRON AGE composite price of pig

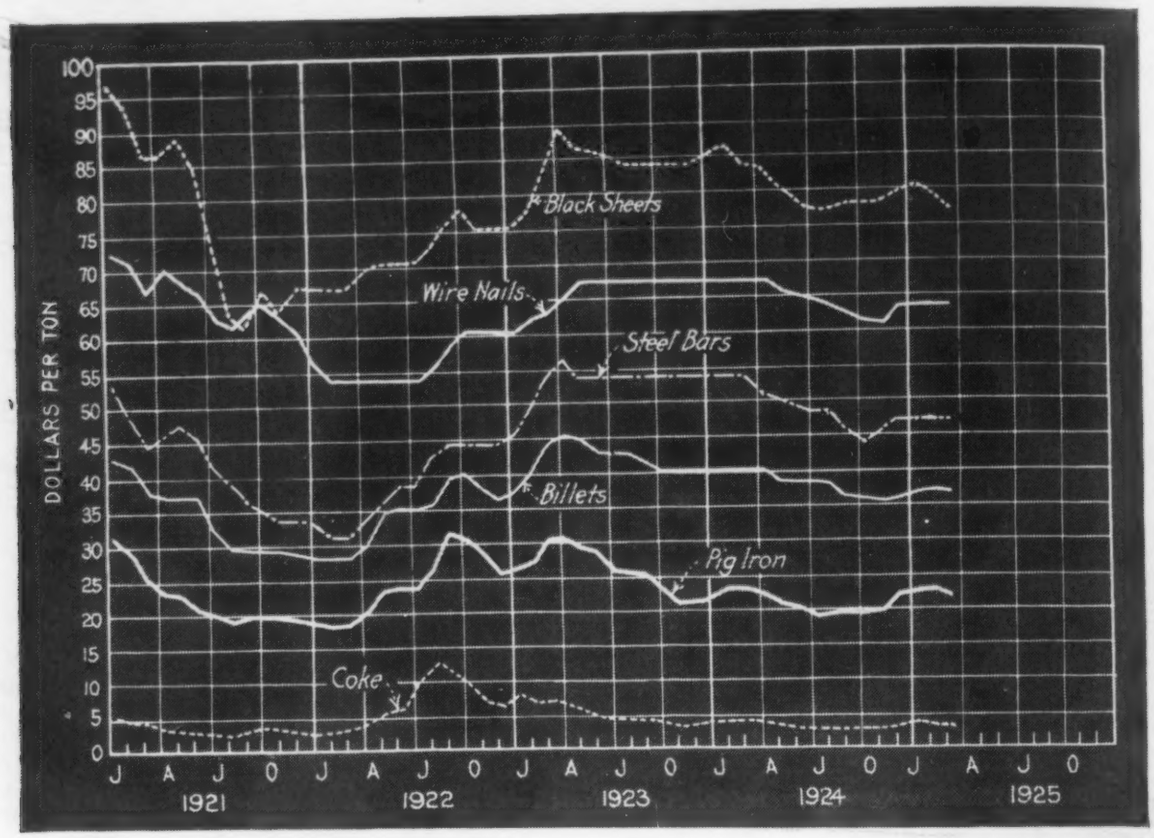


Fig. 3. Weakness in Finished Products Spreads to Pig Iron and Billets

The prices shown are averages of weekly quotations appearing in THE IRON AGE.

iron decreased in March for the first time since July, 1924.

Weakness in Prices

MUCH the same observation may be made with reference to the price structure shown in Fig. 3 as was made a month ago. All the curves were either maintained on a level or moving downward at the end of March.

The chief development has been that the weakness noted last month has spread further among the primary and intermediate classes of product, affecting particularly pig iron and billets.

The average price of foundry coke in March declined by about the same amount as in February. Coke has now reached so low a level and indications of curtailment in coke production are so pronounced that much lower prices do not seem likely.

The weakness in the pig iron markets which was predicted last month has continued to manifest itself and further declines are practically certain. Large melters are working on material purchased in the past and appear to be in a waiting attitude. The reduction of 50c. a ton in Lake Superior ore will doubtless slightly increase the tendency toward lower iron prices, though it is to be remembered that only 2 or 3 per cent of all the ore used is sold in the open market, large merchant iron producers having their own ore reserves. Billets are down in price, the March average being the first monthly figure to show a decline since last November. From Pittsburgh come reports of slowness in specifications on sheet bar contracts at $37, which indicates that the market for semi-finished products is weak.

Bars and nails held steady, but the decrease in the price of black sheets continued. According to reports there is a considerable accumulation at sheet mills, where production has been in excess of shipments for some time. In view of the relatively low level reached by sheets and the improvement in automobile demand, it would seem reasonable to conclude that the decline in sheet prices will soon be checked. It may be noted that the March drop was at a less rapid rate than that of February.

Further weakness in the price of finished steel seems most likely to develop in shapes, pipe and plates.

Scrap has failed to hold the local gain reported not long ago and in some markets it has registered new lows. Heavy melting scrap at Pittsburgh is now reported at $4.50 per ton below the peak reached in January.

Appointments in Foreign and Domestic Service Announced

WASHINGTON, April 14.—A number of appointments in the foreign and domestic service of the Department of Commerce were announced last week. Don C. Bliss, Jr., Trenton, N. J., was named as Assistant Trade Commissioner to Bombay, India. Mr. Bliss has been connected for the past two years with the Tokio office of the Bureau of Foreign and Domestic Commerce. Philip E. McKenney, Tacoma Park, Md., for the past two years connected with the office of the American Trade Commissioner at The Hague, has been designated as Assistant Trade Commissioner in charge of that office. Raymond C. Miller, Vincennes, Ind., formerly Assistant Chief of the European Division, Department of Commerce, has been made Assistant Commercial Attaché to Paris. William E. Vaughn, Jr., has been appointed assistant manager of the Detroit office of the Bureau of Foreign and Domestic Commerce. He recently returned from South Africa, where he served for four years as a member of the staff of the American Trade Commissioner at Johannesburg.

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The laboratory pointed the way.—Methods of forging and rolling aluminum alloys hitherto regarded as suitable for casting only were worked out on experimental rolling mill.—Page 1130.

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"Shall we use die casting or a machined part?"—Sometimes one is cheaper, sometimes the other, depending on amount of machining necessary. The answer is, compare total machining cost with die casting quotation.—Page 1171.

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A case of misplaced affection.—Sentimental regard for old machines, economically defunct, blinds manufacturer to the savings modern equipment will make for him.—Page 1119.

Inspect jigs regularly.—Big cash register manufacturer reports appreciable savings by inspecting jigs after use on one job and before issuing again on another.—Page 1114.

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Higher tariff to be urged.—Washington reports a movement is on foot to petition the next Congress for a general upward tariff revision.—Page 1121.

Steel founder saves money by redesigning patterns for convenient removal of risers.—Better castings are obtained by making generous allowance for risers so placed that machine-cutting oxy-acetylene blowpipe can operate conveniently. Cuts are smooth, requiring minimum time for final finishing.—Page 1120.

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REFUSE TO MODIFY SCALE

Miners' Union Will Not Meet Operators—Continued Idleness Probable

PITTSBURGH, April 13.—As has been expected and predicted, the United Mine Workers of America will not accept any modification of the wage scale agreement reached in the conference in Jacksonville, Fla., in February, 1924, which is to run until April 1, 1927. The Pittsburgh Coal Producers Association announced late last week that John L. Lewis, president of the miners' union, had declined an invitation extended by operators of union mines in western Pennsylvania and in Ohio to discuss a revision of the present wage contract. Mr. Lewis in his letter declining the invitation was quoted as saying: "I cannot believe that a joint conference resulting in a modification of the present wage structure would be a constructive or helpful act in the interest of the operators or mine workers or in any manner prove to be a panacea for the deep-seated ills of the industry." His letter closed with the statement: "United Mine Workers of America will be glad to give the most profound consideration and helpful cooperation to any practical plan of improvement suggested by the operators, parties to the agreement, which does not contemplate a modification of existing wage contracts, or a reduction in the earnings of our people."

The basis of the invitation for a discussion of the situation being that the "production cost of union-mined coal is above the selling price of non-union coal," and that "the union miner is directly in competition with non-union labor," there seemingly is no way out for the operators of union mines but to continue the program of curtailment of production.

The Pittsburgh Coal Co. has only 18 of its 70 operations open and of these only nine are producing with any degree of regularity. These are mines producing high grade gas coal, demand for which is constant while the supply is limited. A difficulty that besets this and other commercial producers of coal in impressing the coal miners of the necessity of a reduction in wages is the fact that steel companies operating mines under an agreement with the union continue to give reasonably full employment and are paying the full union scale. Naturally, the union officials feel that if those producing coal for their own use can pay the scale, others should be able to do so. And an undisclosed thought in the minds of Mr. Lewis and his associates in their refusal to consider an adjustment of the scale, is that if they consented to a modification, the coal operators or some of them would consider that the Jacksonville contract had been abrogated and that they were free legally to operate on an open shop basis.

The carryover of coal in the Northwest is said to be heavy this year and apparently the demand from that direction this year will be below the average of the past few years. Railroads tributary to Pittsburgh are demanding their supplies from their regular sources as cheaply as they can obtain them from outside the union districts. The prospect for business is so poor for the sale of union-mined coal and retention of the railroads and other large users as contract buyers being possible only through greater losses than were sustained last year, the commercial producers are working to the idea that it is cheaper to keep the mines idle.

Labor Problem Fails to Develop in the Mahoning Valley

YOUNGSTOWN, April 14.—The expected labor problem in the Mahoning Valley has failed to materialize this spring, because steel company operating schedules have not expanded as expected. Usually at this season of the year, common labor is drawn from the mills and blast furnaces to outside forms of employment, such as building construction, railroad maintenance, road work and the like.

This spring, however, the mills are not complaining about a shortage of men; in fact, the supply of workers is ample for the jobs to be had. There are no signs of a labor shortage, states one steel company employment manager.

Earlier in the year, when schedules commenced to expand, there were indications the industry would be confronted by scarcity of available workmen at this season, especially of common laborers. Some anxiety was expressed by employment managers over the situation, due to the fact that the usual sources of supply, immigrants from the Central European countries and negroes from the South, were no longer to be depended on.

The common labor market appeared to present the most difficult problem, as the mills are well supplied with semi-skilled men, advanced from the ranks of laborers. However, the problem has solved itself through failure of the plants to approach capacity production, and their ability therefore to operate with normally adequate forces.

Large Production of Weirton Steel Co.

Details of the March ingot production of the Weirton Steel Co., Weirton, W. Va., are now available, and considering the type and rated capacity of the furnaces the output is believed by the company to be a record. The seven 100-ton stationary furnaces at Weirton produced a total of 52,208 tons in March, an average of 8315 tons per furnace. In a previous statement in these columns as to the production of this company, reference was made to a higher record per furnace at another plant, but in the latter case duplexing was followed and the furnaces were of the Talbot tilting type with four tappings in 24 hours. Thus the two performances were not fairly comparable.

The Weirton Steel Co. output by furnaces was as follows: Furnace No. 1, 8351 tons; No. 2, 7859 tons; No. 3, 8127 tons; No. 4, 8554 tons; No. 5, 7913 tons; No. 6, 8477 tons; No. 7, 8927 tons.

COMING MEETINGS

April

National Metal Trades Association. Wednesday, April 22. Twenty-seventh annual convention, Hotel Cleveland, Cleveland. J. E. Nyhan, Peoples Gas Building, Chicago, secretary.

American Welding Society. April 23, 23 and 24. Annual meeting, Engineering Societies Building, New York. Miss M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

American Electrochemical Society. April 23, 24 and 25. Annual spring meeting, Hotel Niagara, Niagara Falls. Dr. Colin G. Fink, Columbia University, New York, secretary.

National Supply and Machinery Distributors' Association. April 27, 28 and 29. Annual convention, Ambassador Hotel, Atlantic City. George A. Fernley, 505 Arch Street, Philadelphia, secretary-treasurer.

Southern Metal Trades Association. April 28 and 29. Annual convention, San Antonio. W. E. Dunn, Jr., Atlanta, secretary.

New England Trade Conference under auspices of the Chamber of Commerce. April 29 and 30. Providence.

American Institute. April 27 to May 2. Exposition of Inventions, Engineering Societies Building, New York. Headquarters of institute, 47 West Thirty-fourth Street, New York.

ESTABLISHED 1855

THE IRON AGE

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The New Administration Policy

WE referred recently to the change of policy on the part of the Federal Trade Commission, which no longer is going to be a mere tormentor of business. Under an administration of broad vision it may yet be made to perform a useful function, though not one that is really necessary.

Not the least of the benefits that have accrued from the recent change of atmosphere in Washington is the exposition of President Coolidge's idea that men set to perform complicated duties may well have some knowledge of the subject. Thus he considers an expert in railroad economics to be a wiser selection for the Interstate Commerce Commission than a lawyer or a lame-duck politician. Conditions were different when the determining principle at Washington was the belief that all big business is crooked, and that association with any corporation even as an expert was a disqualification. Considering that experts in many important branches could obtain their experience only in connection with corporations, this disqualification was equivalent to confining service in the Government to semi-experts, quasi-experts, or ratings not even as good as the latter.

Much depends always upon how things are to be done. Mr. Sargent, the new Attorney-General, declared upon assuming office that he would try to enforce the laws, including the prohibition and anti-trust laws. Of course, this was a platitude, inasmuch as he had accepted the office for just that purpose. If he had declared that he was not going to enforce the laws, that would have been an announcement really worthy of attention. In due course of time such a policy, if put in practice, would lead to impeachment.

However, there is a great difference between the mere enforcement of the laws and making the existence of laws the excuse for malevolent, officious, or stupid prosecution. The Department of Justice may act as policeman or prosecutor, or both. There have been times when it has given too much thought to the policeman idea.

The persecution of the copper producers was largely an exhibition of that idea. This was conducted in a way that was particularly harassing and of a nature to cause innocent people to go to great expense in defending themselves. At the present time the department is investigating the lead producers. A small producer made a complaint against them. A citizen thus feeling aggrieved, it was the duty of the department to investigate his complaint, and nobody finds fault with such performance of duty. So far as we know this investigation is being conducted in an intelligent way.

Nevertheless it may be pointed out that in the ordinary police court a complainant must offer something of material character in the form of evidence, not merely conjecture, before the authorities will move; and it is proper that conditions should be thus. It may be pointed out, moreover, that the Government in Washington possesses many kinds of expert bureaus, that may be used by the administrative arms as advisors and consultants, but are seldom so used.

If the Department of Justice had consulted the bureaus of the Department of Commerce in respect to either the copper or the lead producers, we are quite sure that there would have been no investigations of either; or rather advice that there should not be any. This is, perhaps, an illustration of the absence of team work in Washington, that is costly not only to the Government but also to its citizens.

Cycles and Psychics

WERE additional proof needed that a little knowledge is a dangerous thing, the prevailing attitude of some business men toward industrial conditions would furnish it. Along with the growth of legitimate interest in the application of economic information to everyday business, we see at times the apathetic attitude of those who have accepted a little knowledge with no understanding whatever. Curves and charts and cycles are good and useful things; but out of the columns of figures and the pages of graphs has come, too

often, a blind belief in every prediction. Let even a tyro issue a new cycle theory and there are many willing to give it all the sanctions of a law. Does the cycle say that business is on the down grade? Then it must be so, and there is no use in trying to do anything about it!

The dangers in such a counsel of fatalism are obvious. Does the mariner, upon noting a fall in the barometer, throw up his hands and cry, "All is lost"? He does not. He takes a few reefs in the mainsail and prepares to take advantage of the strengthened wind of which he has warning. When Joseph foresaw a seven-year famine did he prepare to starve quietly and painfully? He redoubled his efforts to meet and overcome the threatened condition—and he succeeded.

So-called business indicators should have, in so far as they are reliable, but one message for the business man: Work a little harder, sell a little more, produce a little more economically. Coming events cast their shadows before; but that is no reason to be afraid of shadows.

Capital for Water Power

A RECENT compilation by the Department of the Interior of the developed and potential water power of the world directs attention to the circumstances that attend this development, which has been proceeding apace. It seems that in the three years from 1920 to 1923 there was an increase of approximately one-fourth in the world's developed water power. In Europe the underlying and compelling influence is the high cost of coal. In the United States, relative to Europe, coal has been very cheap, but we have had a much better supply of capital, and thus while we have lagged behind Europe of late we have done pretty well.

The Interior Department presentation is very full, covering all countries of any importance. For various reasons the figures cannot be exact, but they have been carefully compiled and are useful in making a general presentation. The recapitulation by continents is given below. The developed and potential powers are not directly comparable, for the developed power is given in capacity of water wheels (or equivalent), which naturally exceeds the average water available, while the potential power (including that already developed) is based upon power available 90 per cent of the time at 70 per cent efficiency. Thus, while the United States is counted at 10,000,000 hp. developed, and the potential at 35,000,000 hp., this does not mean that 29 per cent has been developed. With complete development there would probably be about 70,000,000 hp. of water wheel capacity.

The World's Water Power in Hp.

	Developed	Potential
North America	13,700,000	66,000,000
South America	675,000	54,000,000
Europe	12,300,000	57,000,000
Asia	2,000,000	69,000,000
Africa	14,000	190,000,000
Oceanica	220,000	17,000,000
Approximate total	29,000,000	453,000,000

It is a curious thing that the potential water power of four continents runs pretty much the same, one might say practically the same when uncertainties of estimating are considered, and that Africa shows as much as any three of the other continents. It seems rather unfortunate.

Excluding Africa as a hopeless case for the next generation or more, and assuming that the power installations represent double the minimum water available at the points, there is a development of about 5 or 6 per cent of the total. There is such a wide gradation in availability of water power and usefulness of power at different points that it is obvious that much more developing can be done without much greater difficulty than has been overcome in the installations now in service. If not, so much as this would not already have been done.

To forecast what will be done in further development, say in the next quarter century, might be considered an economic question, but the problem really goes deeper in its roots than that, being in a sense a psychological one. It will be granted that it is largely a matter of capital and foresight, but that is psychological. Capital is produced by hard work and thrift. With any nation, the question of how much capital it is going to have a decade or a quarter century hence depends chiefly upon how hard the people are willing to work and how thrifty they are. Engineering skill is indispensable in developing water power, but engineers cannot function if they do not have money to spend, and they will have money only as people work and save.

Machine Tool Cost-Saving

WHAT would be the saving in cost of production in a machine shop which five years ago was considered to have a wholly adequate equipment were it to be modernized completely according to the 1925 standard of efficiency? The question has been brought up with a group of machine tool men, representing large manufacturers whose product covers a wide field. It was asked these men individually, yet their answers agreed very closely. They held that the full modernizing of a factory in which machine tools constituted the principal equipment would result in a saving of 20 per cent in production costs. Several put the gain a little higher, none put it lower. Therefore it seems fair to accept 20 per cent as a measure of the advance which American machine tool designers have made in the period since business was last at a high peak.

Were the same test to be applied in a shop which five years ago or ten years ago was below the accepted high standard of the day, and which has made no general replacements of the old machinery—there are more than a few such—the percentage of possible decrease in cost of manufacturing would surprise its owners not a little.

Scores of instances are cited in the trade of recent advances in machine tool practice. Typical of these are centerless grinders, turning out hundreds of pieces per hour; automatic cylindrical grinding machines, doing precision work at an almost inconceivable rate; planers with table speeds of 90 feet a minute and stopping to a hair line; automatic gear-cutting machines, cutting all the teeth of a ring gear in a few minutes; internal grinders, automatically roughing and then finish-

ing to narrow limits an enormous output; turret lathes which have reduced turning costs by large margins; the automatic milling machine and continuous machine, which have brought marked developments in the range of applications; drilling, boring and other operations on an output basis which a few years ago would hardly have been deemed possible.

The inquiry shed much light on the developments in the industry, and made clear why some of these machinery men maintain that the half decade just ended has been one of the most important periods, if not the most important, in the history of the machine tool business, ranking with the introduction of the high speed steels and the revolutionary redesigning of machinery that followed. In that other great period the effort was to create machines so massive in their construction and so powerful in their drive as to give a hitherto unconceived production in roughing work. Finish was not considered. The refinements of precision work came along more gradually. In the new era of machine tool practice improvements have been along both lines, that of the maximum production that comes with the brute strength of a machine, coupled with accuracy on the finishing operations.

Various types of machines that when demand was last at its height were in the embryo stages have since evolved into standard models, proved out under severe factory conditions. Older types have been greatly improved. Many progressive users of metal-working equipment, while realizing that a great work has been done for them, have yet to learn the full measure of the accomplishment.

The efforts to save in production costs have followed two lines: One has been in the application of greater power and in mechanical ingenuity to render operations automatic or semi-automatic. The second, and fully as important, has been in simplifying design and in other ways seeking to make machines as nearly as possible proof against the carelessness or ignorance of unskilled men as operators. A chief objective of the present-day machine tool designer is to produce a machine that can be operated as well by an inexperienced as by a skilled mechanic. Therefore simplicity is necessary, together with a mechanism which cannot easily be put out of commission. In this respect the designers have done a great work.

The sum total is the 1925 machine tool which will produce at a very high rate when operated by a worker whose wage is nearer that of the common laborer than of the expert mechanic. This is an important reason why the latest type of equipment is a great cost-reducer. If machine tools still required as operators the class of mechanics employed 15 or 20 years ago, industry would be crippled beyond relief, for only a fractional supply of such men would be available.

It is easy to see where the American machine tool builder has again outstripped his foreign competitors. Nothing designed or produced abroad comes near the 1925 machines made in the United States. Foreign countries have cheap labor. American users of machine tools must pay their men much more. But they have the opportunity to equip themselves to meet low labor costs with low machine costs, distributing labor over so large an output as to bring their product within reasonable competitive limits.

Sporadic Steel Imports

FOREIGN finished steel is as yet by no means a competitive factor on a large scale. Total imports of iron and steel in February at 92,373 gross tons, the largest in two years, appear formidable on the surface. The January total of over 77,000 tons is also large. An analysis of the figures for the two months, however, shows that raw materials and not finished steel made up the large majority. For the first two months of this year about 84 per cent of the total was pig iron, ferroalloys, scrap and semi-finished steel. Thus only 16 per cent, or about 14,300 tons per month, was rolled steel and other finished forms such as pipe and castings. This volume is less than the average of 1924, when about 15,000 tons per month of finished rolled products was imported. To become a competitive factor, therefore, these imports will have to reach much larger proportions, in view of a monthly consumption of fully 2,250,000 tons of domestic steel products.

CORRESPONDENCE

Requests Technical Magazines for French Schools

To the Editor: It has been my good fortune during my year's leave of absence from the University of Chicago to be able to visit many of the technical schools in France. These schools have found the economic situation resulting from the war a heavy burden, for their resources have not increased in anything like the same ratio as their essential expenditures. One result has been to cut them off from the possibility of subscribing to American technical and scientific magazines for, in addition to limited resources, the rate of exchange has been heavily against them. The subscription to a five dollar American magazine delivered in France costs them, for example, the equivalent of a week's wages for a first class machinist.

I wonder if there are some subscribers to your magazine who do not permanently file or clip their copies who would be willing to send them regularly to some French technical school which would appreciate greatly this addition to their teaching material. If there are any such, and they would send their names and addresses to me (52 Bd. Pasteur, Paris-XVe, France; after Sept. 1, 1925, 5529 University Avenue, Chicago, Ill.), or to Monsieur Firmin Roz, (96 Bd. Raspail, Paris-VIe, France) Directeur de l'Office National des Universités et Ecoles Françaises, we should be glad to give each the names and address of a school to which to send his copy. Monsieur Roz has gladly consented to handle this matter permanently and, as he has a thorough command of English, subscribers will have no difficulty in corresponding with him, and they may rest assured that when I have left France, any information which they may desire can be easily obtained from a competent source.

PAUL M. ATKINS.

Paris, France, March 30.

Supreme Court Sustains Employers

Decision in Case of San Francisco Organizations Regarded as Highly Important in Effect on Efforts to Prevent Union Domination

WASHINGTON, April 14.—Rated as a decisive victory for the open shop principle, the United States Supreme Court yesterday in an unanimous opinion rendered through Mr. Justice George Sutherland held in effect that there is no violation of the Sherman Anti-Trust Act in effective measures of employers to resist domination of labor unions when such policies do not result in material restraint of interstate commerce. Dealing with the case of the Industrial Association of San Francisco and other organizations, the case was extremely hard fought and was, in fact, a struggle between employers' associations and citizens generally of San Francisco on the one hand and labor unions on the other. Directly it involved the building trade, but actually was broader than this and developed into a contest to institute the open shop principle, or American Plan as it was known, to break away from the tyrannical rule of organized labor which even the quiet tone of the Supreme Court decision so plainly makes evident reigned in the city perhaps to an extent never exceeded in any other city in the United States, even including such cities as New York, Chicago and Los Angeles.

The decision handed down today, which reversed the finding of the District Court of the United States for the Northern District of California, consists of approximately 5000 words and is looked upon as setting a precedent which will give employers a freedom of action against excessive labor union domination such as employers outside of San Francisco have hesitated to exercise. The case was appealed by the San Francisco employing and other interests because of the vast importance of the issues surrounding it.

Tactics of Organized Labor

The lower court had found the appellants guilty of violating the Sherman law in their desperate fight for the adoption of the American Plan or open shop principle, instituted after tactics of organized labor had demoralized and put a stoppage to practically all operations in the construction line in San Francisco. Briefly, the counter stroke of the employing interests consisted of instituting a permit system under which certain supplies were made available to only those contractors who would join the American Plan movement. Except for plaster, all of the materials listed under the system were produced in California and were supplied through the Chamber of Commerce of San Francisco to break the strike which took place in 1921 when the unions refused to abide by a wage award of a board of arbitration.

Aim of the Unions

The unions sought an injunction restraining further execution of the alleged conspiracy of the employing interests, a dissolution of certain of the associations and other "relief." The Federal District Court declined to dissolve any of the appellants or interfere with their general activities, but entered a decree enjoining them specifically among other things, from requiring any permit for the purchase, sale or use of building materials or supplies produced without the State of California and coming into that State in interstate or foreign commerce. Speaking of plaster as being the only material exception to the list of materials governed by the permit system, the Supreme Court said it "was brought from the outside but consigned to local dealers in San Francisco and brought to rest in sales rooms and warehouses and commingled with other goods and property, before being subjected to the permit rule."

Not a Violation of Sherman Act

"With the conflict between the policy of the 'closed shop' and that of 'open shop' or with the 'American Plan' per se we have nothing to do," the opinion says. "And since it clearly appears that the object of the plan was one entirely apart from any purpose to affect interstate commerce, the sole inquiry we are called upon to make is whether the means employed to effectuate it constituted a violation of the anti-trust act; and, in the light of the evidence adduced, that inquiry need be pursued little beyond a consideration of the nature of the permit system, what was done under it, and the effect thereof upon interstate commerce."

Basis of Decision

The decision makes a resume based upon this inquiry. In so doing it outlines the basis of the lower court's decree and picks out what are held to be the flaws in it. Among other things it is stated there is no evidence that material purchased outside of California was of importance. It is further stated that there was no evidence that outside materials were subjected to the permit rule. What interference the permit system had with the free movement of materials and supplies from other States the decision pointed out, was "purely incidental to the accomplishment of a different purpose," and was indirect. Replying to the argument of the Government that persons in other States were directly prevented or discouraged from shipping into California, the Supreme Court said the "evidence is sharply conflicting with the preponderance in most cases we think on the side of the appellant." A class of interferences strongly pressed in argument was that in respect of plumbing supplies, practically all of which were manufactured outside of California, but not governed by the permit rule. Lists of plumbing contractors who were not observing the American Plan were sent to plumbing supply houses and some of them refused to sell materials to such contractors. This practice was later abandoned before the suit was instituted. Citing the case of the United States against the United States Steel Corporation, the Supreme Court says under these circumstances there is no basis for present relief by injunction.

Commerce Flow Must Be Free

In conclusion, the decision states: "By the foregoing process of elimination the interferences which may have been unlawful are reduced to some three or four sporadic and doubtful instances during a period of nearly two years. And when we consider that the aggregate value of the materials involved in these few and widely separated instances was, at the utmost a few thousand dollars, compared with an estimated expenditure of $100,000,000 in the construction of build-

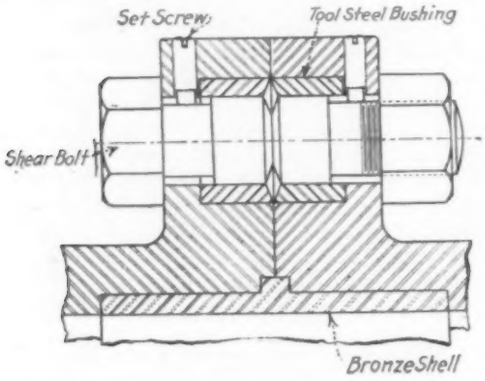
(*Concluded on page* 1168)

BREAKING SPINDLES

Main Roll Drives Protected Against Damage by Inexpensive Method

BY J. H. ALBRECHT*

PROTECTION of steel mill machinery against overloads is an important factor in the operation and maintenance of modern mills. The mechanical man's problem in protecting his equipment is vastly more difficult than with the electrical end and, on some types of drives heretofore, the difficulties have been practically insurmountable. On some drives, the electric protective devices will help considerably. Even in such cases, however, the flywheel effect of the motor armature may be sufficient to cause some damage, particularly if a bad "cobble" should occur at the high speed.



Six Shear Bolts Are Provided in a Combination Coupling and Breaking Spindle Forming Part of an 84-in. Plate Mill of Youngstown Sheet & Tube Co.

On slow-speed direct-connected drives operating without flywheels the proper electric protective devices on the motor will, in most cases, efficiently protect both the motor and the drive from dangerous overloads. If the mill and motor shafts, couplings, wobbler boxes, etc., are designed to carry approximately 250 per cent full load torque (based on motor rating), with reasonable factors of safety, the drive will probably operate satisfactorily.

Great improvements in gear design and the better performance and lower cost of the high-speed motor have led to the rapid adoption of this combination for main roll drives. A flywheel is usually mounted on the high-speed shaft between the motor and pinion. The advantages of this drive are self-evident and the net operating result over a period of years has proved that this type of drive is logical and that it has come to stay. It has, however, added much to the problem of the mechanical engineer, as his apparatus must now stand squarely on its own feet and he can no longer rely on the electric protective devices as in the case of the other drives.

The flywheel is a vast reservoir of useful energy. It appears to the electrical man as a great ally in protecting his motor, supply lines and power house against the shock loads of the mill. To the mechanical man, however, it appears as a vast reservoir of energy which his gears, spindles, wobblers, etc., may be called upon to absorb almost instantaneously. His calculations as to stresses in these parts are now largely guesses, as these stresses depend upon how fast the mill tries to stop the flywheel.

He has two courses open. (1) He can design his drive details large enough to take care of the dissipation of the entire flywheel energy. This would greatly increase the size and weights of all parts and the cost of the mill. The average engineer not familiar with steel mill practice can hardly realize the enormous torques involved. It is a fact that 28 and 30-in. shafts have been twisted off by the torsional strains. (2) The other alternative is to put a weak link in the chain, that is, to weaken purposely some particular section, so that it will fail under heavy overload.

This breaking point is usually built into one of the spindles. While this idea has been used for many years, the results, in a large number of instances, have been disastrous. The design has been such that the spindle in breaking often set up thrusts and "raised Cain" when it broke. The parts involved were usually expensive and the average designs such that the breaking of the spindle meant from 1 to 2 hr. delay. The thrusts and the consequent damage were usually caused by failure to hold the broken ends of the spindle.

Solution of the Problem

There has been recently installed on the 84-in. plate mill at the Brier Hill department of the Youngstown Sheet & Tube Co. a spindle which appears to have eliminated practically all of the difficulties heretofore encountered. This drive is a 2500-hp., 235-r.p.m. motor driving an 84-in., 3-high plate mill. The motor is connected through a flexible coupling to a heavy flywheel which in turn is connected to the pinion of the Kennedy stand by a combination flexible coupling and breaking spindle.

Six shear bolts are provided, as shown on the sketch. The shear bolts are shouldered and are prevented from flying around the mill after breaking by set screws, as shown. After breaking, the shear bolts are free to move back some distance. The shear bolt holes are bushed with hardened tool steel bushings. If the break in the bolt should be ragged, the tool steel bushings will promptly shear off the ragged edge.

An important feature of the design is the means provided for holding the two halves of the center member after breaking. A heavy bronze shell inserted inside the center member is held central by a flange which rests in a recess in the two halves of the center member casting. After the shear bolts have broken, the two halves of the center member are held firmly in line by this bronze shell. In case of a bad cobble or wrapper in the mill the bolts would shear and the mill half of the coupling would stop dead, while the flywheel end would be free to revolve with the flywheel and the motor.

This drive has been thoroughly tried out and it has been found that the required section of bolt is largely a matter of cut and try. In determining this section the bolts were sheared repeatedly and the performance was entirely satisfactory. At no time has there been evidence of a thrust or disturbance. The shear bolts, of ordinary soft machine steel, can be quickly and easily replaced at small expense.

Before the installation of this spindle the mill had broken its leading spindle at frequent intervals. The cost of replacing a leading spindle was approximately $1,000, and the delays encountered were also expensive. By use of the properly designed breaking spindle the mechanical engineer now has a mechanical fuse which approaches in efficiency and simplicity the refillable fuse employed by the electrical engineer.

*Engineer Thomas Flexible Coupling Co., Pittsburgh. This article is abstracted from one in *Iron and Steel Engineer*.

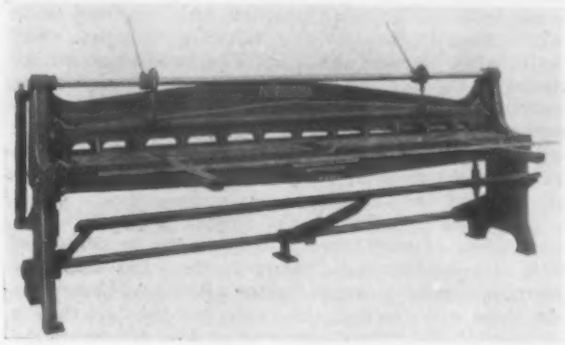
The members of the Electric Hoist Manufacturers' Association report a decrease of 12.87 per cent in the number of hoists ordered in March as compared with the previous month and a decrease in the value of hoists ordered of 13.63 per cent. Shipments of hoists in March increased 37.97 per cent over shipments in February, 1925.

An exhibition of motor driven machine tools will be held at its demonstration room at 130 Seventh Street, Pittsburgh, by the Motch & Merryweather Machinery Co. from April 17 to 25. The exhibition will be open for demonstrations from 10 a. m. to 10 p. m. each day.

Foot-Operated Squaring Shear

A foot-operated squaring shear, with a nominal cutting length of 120 in. and intended for cutting No. 18 gage and lighter mild steel, has been added to the line of the Niagara Machine & Tool Works, Buffalo.

The arrangement of the machine, which is designated as the No. 1120-F, may be noted from the accompanying illustration. Among the outstanding features is the positive hold-down which is operated by two eccentrics, and is guided at each end by machined pads

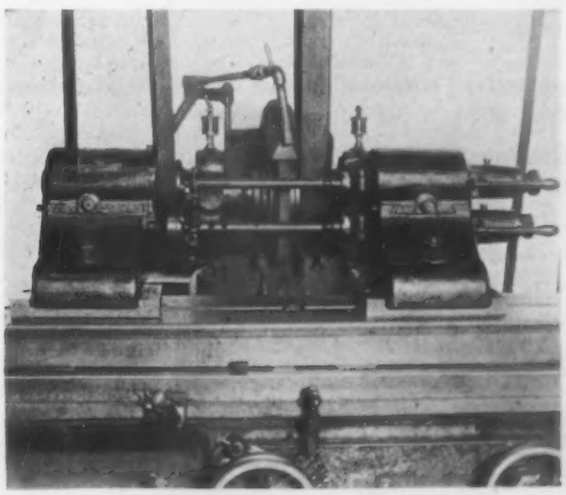


The Back Gage May Be Adjusted From the Standing Position and From Either End of the Machine

on the upper knife bar. The treadle is strongly constructed and extends the entire length of the shear, as shown. The patented parallel-screw adjustable back gage incorporated may be adjusted from a standing position and manipulated from either end of the machine. The simplicity of construction of the gage is a feature stressed. The back of the upper knife bar is of truss form. The elimination of counterweights and unnecessary springs combined with balanced distribution of metal is said to assure ease of operation.

Duplex Grinding Attachment

A duplex attachment for use on grinding machines, being mounted in place of the regular work-holding head and designed to permit of the grinding of two cylindrical pieces simultaneously, has been developed



Two Cylindrical Pieces May Be Ground Simultaneously. Increased production and high finish on the work are claimed

recently by the Hi-Speed Machine Tool Co., 71 Willis Avenue West, Detroit.

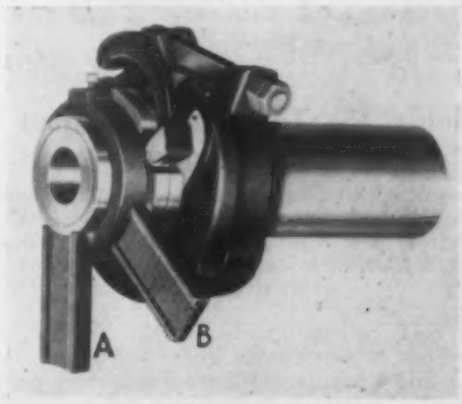
The device is for installation on 10-in. grinding machines of standard make but may be used on larger machines by the application of fillers. It will grind work up to 3 in. in diameter and to any length within the capacity of the machine on which it is installed. Ease of application is a feature of the device, drilling of the grinder bed or the use of extra belts and pulleys being unnecessary. Close accuracy is claimed, and unusual smoothness of finish is attributed to steadying of the work and overcoming of vibration which results from locating the work being ground above and below the axis of the grinding wheel.

The lower spindles are adjusted to the grinding head in the same manner as in the standard external grinder, the upper spindles then being adjusted by means of a micrometer adjustment to correspond with the lower spindles. A locking device is provided, both the upper and lower spindles being locked by one motion. The pressure of the tailstock centers is controlled by means of springs. These centers are withdrawn independently of each other, and can be locked individually or together. The distance between the two spindles is 3⅛ in. It is claimed that in one installation 100 pieces, 6 in. long and ⅝ in. in diameter with two dimensions to grind, were ground to limits of 0.001 in. in 2 hr.

One Revolution and Stop Clutch

A clutch intended for use on machines that require stopping at a certain index or after completing a given cycle and which may be set for disengagement after one revolution, given fraction of one revolution or a definite number of revolutions, is shown in the accompanying illustration.

The clutch is a recent product of the Conway Clutch Co., Cincinnati. Nine sizes are available and it may be furnished with or without an extended sleeve, sprocket or gear to suit particular conditions. The construction



The Clutch May Be Set to Stop the Machine After a Fraction, One or a Given Number of Revolutions

is similar to the company's standard compression clutch except in the method of engagement, cams being used instead of the conventional cone. The clutch carrier is keyed to the shaft and the arm of cam *A* is fixed to the frame of the machine, and the arm controlling *B* to a treadle. The clutch is engaged by depressing the treadle which controls cam *B*, the latter then revolving and raising a roller. This causes a friction band to contract around the hub of the sleeve, and motion is imparted to the clutch and shaft. Meanwhile the pressure is taken off the treadle and a spring returns cam *B* to its original position.

In cases where the shaft is running and it is desired to transmit to a belt or chain, the pulley, sprocket or gear is mounted on an extension of the carrier hub and additional friction head is keyed to the shaft. Lubrication is provided in the bore of the clutch carrier, as this part in this case is a loose member. At 100 r.p.m. the smallest size clutch will develop 3 hp. and the largest size, 20 hp.

European Markets Generally Quiet

Slow Resumption in England After Holidays—Threatened Strike in Belgium—French-German Negotiations Again Under Way

(*By Cablegram*)

LONDON, ENGLAND, April 13.

MARKETS are quiet after the holidays. Many Northeastern plants have not yet reopened. Northwest coast producers are fearing further curtailment in pig iron output. Only 13 furnaces are now blowing.

East coast hematite is dull and easy. Foreign ore is dull, Bilbao rubio being nominally 22s. to 22s. 6d. ($5.26 to $5.38) c.i.f., tees.

Steel is quiet and finished iron is easier. Scotch crown bars have been reduced 7s. 6d. to £11 12s. 6d. (2.48c. per lb.), delivered locally. Lancashire bars have been reduced to £12 5s. (2.61c.), f.o.b. export.

The Leeds Forge Co. secured an order for 100 steel truck covered railroad cars for Uganda.

Continental markets remain quiet. A general lockout is threatened in the works in the Hainaut district, Belgium, April 16.

Tin plate demand has improved slightly, but the position is not bright. More mills are running, but only part time. Continental buying is hampered by fresh depreciation of franc exchange.

Galvanized sheets are firm without special demand. Makers generally have fair orders on hand. Japanese specification black sheets have been reduced 30s. to £15, f.o.b., and some small business has been already done.

Declining Pig Iron Output—Small Export Business

LONDON, ENGLAND, April 2.—Conditions in the British iron and steel trades are changed but slightly and improvement is not in sight. During the last few days of March there was some revival of demand for foundry pig iron, and some fair-sized parcels changed hands both for home and export, but it proved to be only a flash in the pan and values quickly fell away again when demand ceased. The production of all grades of pig iron is limited, additional furnaces being continually shut down, but in spite of this, stocks are increasing. This state of affairs is not due to foreign competition, because Cleveland iron is well able to compete with the Continental product, but buyers are few and demand only spasmodic.

The steel industry is in a similar plight, but here competition is more severe and has to be contended with. During the past few weeks there has been considerable comment caused by the placing of orders for new ships with German shipyards, but the fact that in one specific case the German price was £60,000 below the lowest British tender, shows that there is something radically wrong.

The large plans of the various railroad groups are producing a lot of work for certain plants and in some departments fresh orders cannot be executed for several months, but the usual merchant business for export to various foreign ports is a shadow and no more. How long overseas consumers can afford to maintain their reluctance to buy is a matter purely for conjecture, but the fact that more and more countries are endeavoring to become self-supporting, and are launching out into the manufacture of iron and steel and its products, is a factor to which our manufacturers as a whole, must give the greatest consideration.

The Continental position is one that requires a lot of fathoming. The works are said to be in a satisfactory position as regards orders and, in fact, nearly all of them are in arrears with their deliveries. Reports from all quarters, however, indicate that the big overseas consumers, such as India and the Far East, are not, and have not been buying Continental iron and steel, so that the home trade demand on the Continent must be on a very large scale. This applies more to

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British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.78 per £1, as follows:

Durham coke, del'd..	£1	2s.	to £1	2½s.	$5.26	to	$5.38
Bilbao Rubio ore†...	1	2½			5.38		
Cleveland No. 1 fdy..	4	2½			19.72		
Cleveland No. 3 fdy..	3	17½			18.52		
Cleveland No. 4 fdy..	3	17			18.40		
Cleveland No. 4 forge	3	15½			18.04		
Cleveland basic.....	3	17½			18.52		
East Coast mixed....	4	3			19.84		
East Coast hematite..	4	19	to 5	0	23.66	to	23.90
Ferromanganese	15	0	to 15	10	71.70	to	74.09
*Ferromanganese	15	0	to 15	10	71.70	to	74.09
Rails, 60 lb. and up..	8	10	to 9	0	40.63	to	43.02
Billets	7	5	to 8	5	34.65	to	39.44
Sheet and tin plate bars, Welsh	7	17½			37.64		
Tin plates, base box..	1	2⅛	to 1	2¾	5.29	to	5.44
					C. per Lb.		
Ship plates	8	15	to 9	5	1.87	to	1.97
Boiler plates	13	0	to 13	10	2.77	to	2.88
Tees	8	15	to 9	5	1.87	to	1.97
Channels	8	0	to 8	10	1.71	to	1.81
Beams	7	15	to 8	5	1.65	to	1.76
Round bars, ¾ to 3 in.	9	0	to 9	10	1.92	to	2.03
Galv. sheets, 24 gage	16	0	to 16	10	3.41	to	3.52
Black sheets, 24 gage	11	10			2.45		
Black sheets, Japanese specifications	15	5			3.25		
Steel hoops	10	15	and 12	10*	2.29	and	2.67*
Cold rolled steel strip, 20 gage	16	0			3.41		

*Export price.
†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron: (a)				
Belgium	£3	15s.		$17.93
France	3	15		17.93
Luxemburg	3	15		17.93
Basic pig iron: (a)				
Belgium	3	14		17.69
France	3	14		17.69
Luxemburg	3	14		17.69
Billets:				
Belgium	5	5		25.10
France	5	5		25.10
Merchant bars:				C. per Lb.
Belgium	5	16		1.24
Luxemburg	5	16		1.24
France	5	16		1.24
Joists (beams):				
Belgium	5	10		1.17
Luxemburg	5	10		1.17
France	5	10		1.17
Angles:				
Belgium	5	18½	to £6 0s.	1.26 to 1.28
⅛-in. plates:				
Belgium	7	0		1.49
Germany	7	0		1.49
⅜-in. ship plates:				
Luxemburg	7	0		1.49
Belgium	7	0		1.49

(a) Nominal.

France, Belgium and Luxemburg, as for some time past Germany has hardly been a competitor of importance.

BELGIAN MARKET STEADY

Prices Firm but Buying at a Low Ebb—Steel Plants Reduce Wages and Strike Is Called

BRUSSELS, BELGIUM, April 2.—The iron and steel market is stationary with no change in prices. Confidence in the future is not being strengthened by political events, the economic situation and the consequent fluctuations of exchange. In Brussels, buyers have tried unsuccessfully to break the market, but foreign competition is not particularly active and Luxemburg and Lorraine works quote rather high prices.

Following the decision taken by steel works to reduce wages, the workmen of three large plants, Sambre-et-Moselle, Laminoires de Baume and Aciéries et Tôleries de Marchienne, gave notice April 1 of a strike to begin April 15. In reply, the works in the region of Charleroi have announced a general lockout, effective April 15. In the Liège Basin, where salaries are from 15 to 20 per cent less than in the Charleroi region, the workmen accepted the first decrease of 5 per cent without discussion. It is still believed in some quarters that the strike may be averted.

Pig Iron.—The market is firm with a tendency to rise, and export demand satisfactory. No. 3 is quoted at 355 to 360 fr. ($18.07 to $18.30) and occasionally at 365 fr. ($18.53); Lorraine and Luxemburg furnaces quote about the same prices as Belgian. Basic iron ranges from 340 to 345 fr. ($17.38 to $17.61).

Semi-Finished Material.—The market is quite firm and some sellers are endeavoring to increases prices based on the limited available supply. Luxemburg prices are high and Lorraine quotations generally nominal. Quotations for export, f.o.b. Antwerp, are: Blooms, £5 3s. ($24.62); billets, £5 6s. ($25.33), and slabs, £5 8s. 6d. ($25.93).

Iron and Steel Bars.—The high scrap market and wage rates are forcing iron bar mills to maintain a price level in the face of a light demand. Domestic quotations are about 590 fr. ($30) a ton, while export prices range from £6 to £6 2s. 6d. Steel bars show occasional weak spots and the quoted schedule of £5 15s. per ton is higher than the actual market, which is fully a shilling a ton less. For export steel bars are quoted at £5 8s. to £5 11s. 6d. per ton ($24.81 to $26.65), f.o.b. Antwerp. Wire rod prices have sagged somewhat in consequence of slight German competition, but hoops continue in demand.

Sheets.—Prices are unchanged and fairly firm, producers being well booked for all gages, particularly the heavy and medium. Heavy sheets, f.o.b. Antwerp, are £7 per ton (1.48c. per lb.), and medium gage sheets £7 12s. 6d. (1.98c. per lb.). The light gages are weaker.

(*Other Foreign Markets on page* 1173)

Purchase of Lumen Bearing Co. by Falcon Bronze Co. to Be Ratified

With acquisition of the plants at Youngstown and Pittsburgh of the Lumen Bearing Co., the Falcon Bronze Co., of Youngstown, will become the most important producer of bronze and copper castings in the Youngstown district, with a capacity of upwards of 5,000,000 lb. of finished castings per year. Details of the purchase have been worked out and formal ratification by stockholders of the Lumen Bearing Co. is the only step necessary to close the transaction. This will be done April 18, at a special stockholders' meeting called for such a purpose.

The Lumen Bearing Co. entered the Youngstown district in 1919, establishing a modern plant in the Poland Avenue district. It also owns the New Process Copper Co., operating a plant on Butler Street, Pittsburgh, devoted principally to manufacture of copper castings for blast furnaces. This property is included in the acquisition by the Falcon company.

G. A. Doeright and James L. Wick, Jr., are the active interests in the Falcon organization. Mr. Doeright is a veteran in the business, having operated a plant on South Phelps Street, Youngstown, for many years. Mr. Wick, formerly in the operating department of the Youngstown Sheet & Tube Co., has been with the Falcon organization for a number of years.

More Interest in Old Material Market in Youngstown District

YOUNGSTOWN, April 14.—With restoration of the usual differential between heavy melting scrap and basic pig iron, melters are showing more interest in the old material market, but current purchases are in moderate volume. Heavy melting, at a range of $17 to $18, compared with basic iron at $21, furnace. Earlier in the year, this grade of scrap advanced to $23, reaching a price above that of iron, causing melters to alter the usual proportions of iron and scrap in the open-hearth mix, giving preference to pig metal. With a reversal in price conditions, however, the customary mix has been restored.

As a rule, melters have fairly liberal stocks of scrap metal on hand. Some dealers are buying scrap in a cautious way, while other interests have withdrawn from the market altogether.

Mahoning Valley Shipments Larger in March Than in February

YOUNGSTOWN, April 14.—Shipments of finished steel products by Mahoning Valley manufacturers compared favorably in March with February shipments, but fell below January. Tonnage in finished lines shipped by Valley mills the first quarter approached 75 to 80 per cent of capacity production. In March, operations were curtailed, due to some overproduction in January and February, and shipments the past month about balanced production.

Current business is confined largely to material wanted for shipment as soon as possible, and forward commitments are confined to moderate tonnages, depending upon the product involved. In steel pipe, for instance, especially lapweld tubes, there is perhaps more forward ordering than in other finished materials.

Sheet business coming through is largely for early delivery. One executive states the character of current buying indicates that consumers have no large stocks on hand, and he looks for continuance of the present method of buying for some time.

Activity in the merchant iron market is at a low ebb. One merchant interest reports the sale of 1500 tons of No. 2 foundry at $21, Valley furnace.

Prices in the pipe market are holding firm, but aggregate shipments the first three months of this year fell below shipments the first quarter of 1924.

Indications are that business is better in the West than in the East, one interest operating an important Western property reports. Considerable business is developing in territory west of Chicago.

Shipping Steel by Barge

ST. LOUIS, April 14.—A barge loaded with 850 tons of small tees for window sash for the Mesker Bros. Iron Co. from the Carnegie Steel Co., which left Munhall, Pa., March 20, reached St. Louis last Tuesday. The order for the steel had been placed with the Illinois Steel Co., but, because of heavy bookings of the same class of material, was transferred to the Pittsburgh district mills.

The Carnegie Steel Co. recently shipped from the Pittsburgh district a barge loaded with 850 tons of structural steel for the Arkansas Foundry Co., Little Rock. The material was shipped by water to Memphis and thence by rail to the Arkansas capital.

EXPORT SALES SMALL

Japanese Sheet Market Demoralized—German Nails Offered in the United States

NEW YORK, April 14.—While importation of European steel for sale to American consumers located near seaboard continues fairly active, export transactions are few in most markets and, as a rule, confined to small lots. The usual seasonal repairs and extensions among sugar centrales is bringing in a fair volume of purchasing from Cuba, Central American markets, the Philippines and other sugar producing centers. Lots ordered usually are so small that they are furnished by warehouses.

The Chinese market, while not particularly improved in point of actual purchasing, is apparently slightly more active, as merchants are more inclined to make counter offers on second hand material and wire shorts. In some instances Chinese buyers are evidently willing to go as high as $47 per ton, c.i.f. China for wire shorts, which is $2 to $3 a ton higher than their offers of a few weeks ago. On bar crop ends and similar grades of material $26 to $28 per ton has been offered, but is too low to interest the American seller.

The Japanese merchant market continues weak on both sheets and tin plate. Light gage black sheets are being sold out of stock in Japan at prices that would necessitate quotation by American sellers of as low as $72 per ton, c.i.f. Japan, in order to compete, after paying the 15 per cent duty. British makers recently quoted £17 2s. 6d. per ton, c.i.f. Japan ($81.62 per ton), but this was almost $10 a ton too high, although it was $10 under the current quotation by mills in the United States, of $91 to $92 per ton.

The tin plate market is also weak, being quoted at less than the current delivered price of British and American makers, $5.90 to $6 per base box, c.i.f. Japan. Much of this weakness is attributed to the tight money market in Japan, which is forcing many of the small distributors to dispose of parts or all of their stocks, often bought on speculation that the tariff would advance on March 10.

Of the larger business from Japan there is the expected inquiry of the Nippon Oil Co., not yet issued, covering its usual large requirements of tin plate and some current inquiry for rails. One of these rail inquiries is from Nagoya municipality and calls for four miles of 91-lb. high T-rails, one mile of 108-lb. guard rails and one mile of 93-lb. grooved rails. The South Manchuria Railway Co., which came into the market recently for 100 miles of 100-lb. rails and was reported to have placed the business with the Imperial Steel Works, is understood to have awarded only 50 miles for June-July delivery to the domestic mill and is considering bids from foreign makers as well as Japanese on the remaining 50 miles for August-September delivery.

Importing of European steel material for consumers not too far removed from seaboard has to a limited extent succeeded the several months of activity in pig iron importation, now temporarily ended by the decline in the American market and rise in European prices. The greater part of the present influx of foreign steel is from Belgium, Luxemburg and France, German prices being too high as a rule to compete with the other European makers. Most of the tonnages involved are small. Some small lots of flat bars and several fair sized tonnages of bars and shapes have come into Boston, while structural material and reinforcing bars have been sold for delivery to other parts. Bars are quoted by importers at about $34 per ton, c.i.f. Atlantic port, duty unpaid for German Thomas steel and about $31 per ton, c.i.f. port for Belgian or Luxemburg Thomas steel. Open-hearth quality runs from $2 to $3 per ton higher. Although German makers are evidently not able to compete on bars and shapes, sellers of wire products report encountering severe competition lately from Germain nails, quoted from Hamburg at prices as low as $2.30 to $2.40 per keg. c.i.f. Atlantic port, duty paid. According to the claims in some quarters as many as 50,000 kegs of these nails have been sold recently.

German Manufacturers Active in Getting Foreign Contracts

WASHINGTON, April 14.—Including steel, machinery, electrical and construction materials, German manufacturers have been actively engaged in closing foreign contracts, according to a report received by the Department of Commerce from Berlin, which is based on statements in the German press. In some cases, it is claimed, the German bids were considerably below the figures submitted by competing firms in Great Britain and other countries. No conditions regarding payment are stated.

It is declared that if the recent foreign contracts are to be followed by a permanent increase in German exports, one of two things will have to happen: Either the domestic price level must decline to a point where competition is possible in export markets, or German exporters must sell abroad at prices substantially less than those charged to the domestic consumer. The report points out that even allowing for some small successes in obtaining foreign orders, German exports for 1924 were only 64 per cent in gold value of the 1913 figures. When the rise in price in the last 10 years is taken into account, it is explained, the amount of goods exported is hardly more than one-half of the former total. Moreover, it is added, the exports for January showed a slight decline from the high point reached at the end of last year. The drop was from 738 million to 697 million gold marks. Sales to the United States are about three-quarters of the prewar figures.

In listing a number of foreign contracts recently obtained by German makers, the report includes the following: An American order for seamless pipes, placed with the Mannesmann Roehrenwerke; $50,000 worth of valves and muffs taken in Uruguay by the same firm; 15 railroad engines for South Africa, placed with J. A. Muffei; French contract for railroad trucks, given to Lochner of Aix-la-Chapelle; 20 oil tank cars, placed by the South Indian Railroad with the Hannoversche Waggonfabrik; 34 tank cars for India, placed with the Saechische Waggonwerke.

Deep Depression in Iron and Steel Industry in Belgium

WASHINGTON, April 14.—The depression in the Belgian iron and steel industry which began some weeks ago has deepened and is expected to continue until after the formation of the new cabinet, says Commercial Attaché Fayette W. Allport, Brussels, in a cable to the Department of Commerce. Existing unsatisfactory conditions are not traceable alone to the political situation, however, but as well to the continued uncertainty in the French exchange outlook, which renders merchants and buyers unwilling to commit for more than the needs of the moment. There is also the feeling that the iron and steel industries of Europe, practically all of which are producing more than in the prewar period, have over-estimated the absorptive power of their markets, and have now to face a period of diminished sales.

Gain in Employment in Metal Trades

A further gain in employment was indicated in the reports for March of metal working shops affiliated with the National Metal Trades Association. In that month 576,533 employees were reported by 637 shops located throughout the Northeastern, Central and Middle Western States. This was the third gain since December. The figures for the past five months, together with those for June, 1924, are as follows: March, 1925, 576,533; February, 1925, 551,385; January, 1925, 544,807; December, 1924, 530,580; November, 1924, 541,933; June, 1924, 519,997.

UNIT METHOD CHANGED

Simplifying of Price System Continued by Lake Superior Iron Ore Producers

CLEVELAND, April 13.—A change has been made in the method of determining the unit values of Lake Superior iron ores. This is a further step in the simplifying of the price structure which was started by eliminating, in the iron content guarantee, the differential between Bessemer and non-Bessemer ore, placing Bessemer ore on the non-Bessemer base of 51.50 per cent iron content. This change has resulted in reducing the unit value of all grades of ore approximately 1c. and means a slightly lower price on high grade ores than heretofore, and a slightly higher price on low grade ores, as compared with the base price.

Following the announcement of the change in the Bessemer differential, some of the ore people suggested that while the house-cleaning in the ore price structure was under way, it might be well to make a thorough job and eliminate the old method of figuring unit values which is used in computing the actual price of the ore either above or below the base price, depending on the iron content. This was done and the proposed change was adopted late last week.

The unit value has been determined heretofore by adding 60c. to the base price and then dividing the total by the base iron content. Years ago, when nearly all the blast furnaces were located away from the Lake front, the 60c. was added to the base price to compute the unit price, as 60c. at the time was the freight rate from Lake Erie ports to Valley furnaces. Meanwhile many blast furnaces have been built at Lake Erie ports and although these have no rail freight to pay, they have been charged the same unit price as the interior furnaces. Some of the ore people felt that the Lake furnaces were being penalized by the method of computing the unit value and so it was decided to discontinue adding 60c. to the base price in such computation. Under the new plan, the unit value is arrived at by dividing the base price by the figures representing the iron content. The unit values as figured the new way will apply to all 1925 contracts and to practically all long term contracts.

Values of Lake Superior Ores Figured on the New Unit Values. Old Range Bessemer Ore

Base Price $4.55 at Lake Erie Port. Guarantee 51.50 Per Cent Iron Natural. 0.045 Per Cent Phosphorus

Percentage Iron Natural	Percentage	Lake Erie Unit Value	Lake Erie Value, Per Ton
61.00	60-61	$0.08835	$5.39
60.00	59-60	0.08835	5.30
59.00	58-59	0.08835	5.21
58.00	57-58	0.08835	5.12
57.00	56-57	0.08835	5.04
56.00	55-56	0.08835	4.95
55.00	54-55	0.08835	4.86
54.00	53-54	0.08835	4.77
53.00	52-53	0.08835	4.68
52.00	51.50-52	0.08835	4.59
51.50	Base ore	0.08835	4.55
51.00	51-51.50	0.08835	4.57
50.00	50-51	0.08835	4.42
49.00	49-50	0.13253	4.28
48.00	48-49	0.17670	4.11
	Below 48	0.1750	

Old Range Non-Bessemer and Mesabi Bessemer Ore

Base Price $4.40 at Lake Erie Port. Guarantee 51.50 Per Cent Iron Natural

Percentage Iron Natural	Per Cent	Lake Erie Unit Value	Lake Erie Value
61.00	60-61	$0.08544	$5.21
60.00	59-60	0.08544	5.13
59.00	58-59	0.08544	5.04
58.00	57-58	0.08544	4.96
57.00	56-57	0.08544	4.87
56.00	55-56	0.08544	4.78
55.00	54-55	0.08544	4.70
54.00	53-54	0.08544	4.61
53.00	52-53	0.08544	4.53
52.00	51.50-52	0.08544	4.44
51.50	Base ore	0.08544	4.40
51.00	51-51.50	0.08544	4.36
50.00	50-51	0.08544	4.27
49.00	49-50	0.12816	4.14
48.00	48-49	0.17088	3.97
	Below 48	0.17	

Mesabi Non-Bessemer Ore

Base Price $4.25 at Lake Erie Port. Guarantee 51.50 Per Cent Iron Natural

Percentage Iron Natural	Percentage	Lake Erie Unit Value	Lake Erie Value
61.00	60-61	$0.08252	$5.03
60.00	59-60	0.08252	4.95
59.00	58-59	0.08252	4.87
58.00	57-58	0.08252	4.79
57.00	56-57	0.08252	4.70
56.00	55-56	0.08252	4.62
55.00	54-55	0.08252	4.54
54.00	53-54	0.08252	4.46
53.00	52-53	0.08252	4.37
52.00	51.50-52	0.08252	4.29
51.50	Base ore	0.08252	4.25
51.00	51-51.50	0.08252	4.21
50.00	50-51	0.08252	4.13
49.00	49-50	0.12378	4.00
48.00	48-49	0.16504	3.84
	Below 48	0.165	

Unit Value of Mesabi Non-Bessemer Ore for 1925

	If Figured on Old Basis	Figured on New Basis
Unit value	9.417c.	8.252c.
55 per cent iron	$4.579	$4.538
54 per cent iron	4.485	4.456
53 per cent iron	4.391	4.373
52 per cent iron	4.297	4.291
51.50 per cent iron, base ore	4.25	4.25
51 per cent iron	4.203	4.209
50 per cent iron	4.109	4.1265
49 per cent iron	3.968	4.0028
48 per cent iron	3.780	3.8378

The new method of computing the unit value results in little price change in ores running close to the base but the price variation as compared with prices figured on the old basis increases as the percentage of the iron content changes above or below the 51.50 per cent base. Using the old basis of computation, the unit value of Mesabi non-Bessemer ore this year will be 9.4117c., but using the new method of figuring the unit value, it is 8.252c., or a reduction of 1.165c. The unit values of other grades are: Old range Bessemer, 8.835c., old range non-Bessemer and Mesabi Bessemer, 8.544c.; high phosphorus ore, 8.058c.

Mesabi non-Bessemer ore running 48 per cent iron is now $3.837 per ton, as compared with $3.78 if figured the old way, or nearly 6c. a ton higher. Figuring on the basis of high grade ore, or ore with an iron content of 55 per cent the present price of Mesabi non-Bessemer ore is $4.538 per ton as compared with $4.579 were the unit value figured the old way, or a reduction of 4c. a ton.

The fact that prices on high grade ores are reduced slightly under the new method of figuring is of much more interest than the increase in low grade ores, because most of the ore shipped runs above the base guarantee and will carry slightly lower prices under the new unit value. The average iron content of all ore shipped in 1923 was 51.79 per cent, and the average was higher last year.

The actual change in prices on Mesabi non-Bessemer ore of various iron contents figured by the old method and the new method is shown by the following table:

High Phosphorus Ores

Base Price $4.15 at Lake Erie Port. Guarantee 51.50 Per Cent Iron Natural

Percentage Iron Natural	Percentage	Lake Erie Unit Value	Lake Erie Value
61.00	60-61	$0.0805	$4.92
60.00	59-60	0.0805	4.83
59.00	58-59	0.0805	4.75
58.00	57-58	0.0805	4.67
57.00	56-57	0.0805	4.59
56.00	55-56	0.0805	4.51
55.00	54-55	0.0805	4.43
54.00	53-54	0.0805	4.35
53.00	52-53	0.0805	4.27
52.00	51.50-52	0.0805	4.19
51.50	Base ore	0.0805	4.15
51.00	51-51.50	0.0805	4.11
50.00	50-51	0.0805	4.03
49.00	49-50	0.12087	3.91
48.00	48-49	0.16116	3.75
	Below 48	0.16	

Unit Values of Lake Superior Iron Ore for Six Years

	Old Range		Mesabi	
	Bessemer, Cents	Non-Bessemer, Cents	Bessemer, Cents	Non-Bessemer, Cents
1925	8.835	8.544	8.544	8.252
1924	11.364	10.680	10.909	10.388
1923	12.818	12.233	12.364	11.942
1922	11.909	11.262	11.454	10.971
1921	12.818	12.233	12.364	11.942
1920	14.636	14.175	14.182	13.883

Iron and Steel Markets

A QUIETER MARKET

Structural Contracts Largest for the Year—Price Concessions

Lower Rate of Output in Pig Iron and Steel—New Car Buying

In respect to new orders for finished steel, the second week of April has been quieter than the first, a condition in line with recent indications that consumers' stocks have grown under continued heavy shipments from the mills. It is well agreed that the situation does not parallel the reaction of April, 1924, but indications point to a drifting market for some weeks.

The curtailment of pig iron and steel production, in which the first moves were made in the second half of March, has gone farther, though it is not yet great. The Carnegie Steel Co. has put off two blast furnaces and scheduled three others to follow. This will leave 39 active, against 48 at the early March peak. Two more Illinois Steel Co. furnaces have gone out.

Steel production in the Pittsburgh and Youngstown districts is now somewhat less at both Steel Corporation and independent plants. For the country the Steel Corporation rate is just under 90 per cent and that of the independents probably close to 75 per cent.

The weakness in prices of finished products has not been helped by the recent developments in iron ore, pig iron, coke and scrap. However, concessions on new orders for finished steel have not gone to the point of cutting down specifications on business heretofore booked—an indication that the market has not yet receded to the December level.

Reports from Chicago that decisions concerning prices of plates, shapes and bars are pending in Steel Corporation councils have been disregarded by the market, no formal price announcements on these products having been made for three years or more. But Chicago mills are finding increasing pressure from Ohio and Pennsylvania competitors, and on structural shapes 2.29c., delivered Chicago, has been quoted, which figures back to 1.95c., Pittsburgh, as against a common range of 2c. to 2.10c.

In the general quiet of the week there was some new car buying, also an unusual run of structural contracts. Southern railroad purchases featured the equipment market. The Seaboard bought 40 locomotives and the Florida East Coast 21, and the Atlantic Coast Line ordered 700 cars. New inquiries appeared for 6500 cars, including 5500 for the St. Paul, and the amount is expected to be increased by 1800 for the Wabash.

Bookings of fabricated structural steel reported in the week are the largest so far this year, amounting to 54,000 tons. Not counting some 17,000 tons for the New York Edison Co., the tonnage is even then considerably above the weekly average to date. Various business and industrial buildings call for 21,000 tons, public work for 8000 tons, and railroads for 2300 tons.

Many fabricating shops have largely disposed of their back orders and are now in need of work.

Western plate mills are competing for 3500 tons for a Wabash Railway ferryboat. Three Lake boats are pending, two for the Pittsburgh Steamship Co. and one for an Inland Steel Co. interest. In Carnegie sheet piling a late contract is for 3000 tons for three river dams, shipment to be made by river to Louisville, Ky.

Improvement in automobile output has exceeded expectations and a number of foundries serving the industry have had to farm out part of their work.

Agricultural implement works operated at a higher rate in the first quarter than in any like period since 1920, and heavy production will continue for several weeks.

Sheets and wire products have developed low prices. Some sheet mills, to move their stocks, have gone below 3.35c. for black. At Cleveland bars have yielded recently, sales being made by some mills at 2c., Pittsburgh.

Another reduction of 50c. a ton has been made on all grades of pig iron in the Pittsburgh district and some Cleveland sellers have reduced prices 50c. to $1. These declines are attributed largely to the recent lowering of prices of Lake Superior ores. Meanwhile a few merchant furnaces are banking or blowing out, as stocks continue large. In some districts melters are showing more interest in the market and quick deliveries are often requested. Foundries making automobile castings are very busy. Although rather large tonnages of foreign iron bought some time ago are yet to be delivered, new transactions are not numerous and foreign prices are virtually on a parity with those of domestic grades.

THE IRON AGE pig iron composite price dropped 25c. to $21.04 per gross ton, or only 43 per cent above the 1913 average, against a general all-commodity price index 60 per cent higher than in 1913.

The composite steel price, 2.531c. per lb., was not affected by the week's developments.

Pittsburgh

Recessions in Production and New Business Quiet

PITTSBURGH, April 14.—The steel market here after giving some signs of a better demand last week has again receded in activity and the downward movement of production has been a little more rapid than was the case recently. Specifications against old orders are fairly good but there is not much pressure behind them and new business is distinctly quiet. The recent reduction in ore prices coupled with continued indifference on the part of pig iron consumers about supplies is responsible for a further decline of 50c. a ton in all grades of pig iron. The scrap market still is seeking lower levels and with unsettlement in the coal and coke market, there is not much doubt that steel buyers have been tempted to pause and give careful consideration as to whether this is not the time to liquidate their stocks.

The Carnegie Steel Co. has put out two blast fur-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Apr. 14, 1925	Apr. 7, 1925	Mar. 17, 1925	Apr. 15, 1924
No. 2X, Philadelphia‡	$23.26	$23.26	$24.26	$23.26
No. 2, Valley Furnace†	*20.00*	20.50	21.00	22.00
No. 2, Southern, Cin'ti†	24.05	24.05	24.05	26.55
No. 2, Birmingham, Ala.†	20.00	20.00	20.00	22.50
No. 2 foundry, Chicago*	23.00	23.00	24.00	24.00
Basic, del'd, eastern Pa	22.75	22.75	23.75	21.50
Basic, Valley furnace	*20.00*	20.50	21.50	21.75
Valley Bessemer del. P'gh.	*22.76*	23.26	24.26	24.76
Malleable, Chicago*	23.00	23.00	24.00	24.00
Malleable, Valley	*20.50*	21.00	21.50	22.50
Gray forge, Pittsburgh	*21.26*	21.76	22.26	23.26
L. S. charcoal, Chicago	29.04	29.04	29.04	29.15
Ferromanganese, furnace	115.00	115.00	115.00	107.50
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	35.50	35.50	37.00	40.00
O.-h. billets, Pittsburgh	35.50	35.50	37.00	40.00
O.-h. sheet bars, P'gh.	37.00	37.00	38.00	42.50
Forging billets, base, P'gh.	*40.50*	41.00	42.50	45.00
O.-h. billets, Phila.	41.67	41.67	41.67	45.17
Wire rods, Pittsburgh	48.00	48.00	48.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.10	2.30
Light rails at mill	1.80	1.80	1.80	2.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.28	2.28	2.28	2.52
Iron bars, Chicago	2.10	2.10	2.10	2.35
Steel bars, Pittsburgh	2.10	2.10	2.10	2.30
Steel bars, Chicago	2.20	2.20	2.20	2.40
Steel bars, New York	2.44	2.44	2.44	2.64
Tank plates, Pittsburgh	2.00	2.00	2.00	2.20
Tank plates, Chicago	2.30	2.30	2.30	2.50
Tank plates, New York	2.34	2.34	2.34	2.54
Beams, Pittsburgh	2.10	2.10	2.10	2.30
Beams, Chicago	2.30	2.30	2.30	2.50
Beams, New York	2.34	2.34	2.44	2.59
Steel hoops, Pittsburgh	2.40	2.40	2.40	2.90

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Apr. 14, 1925	Apr. 7, 1925	Mar. 17, 1925	Apr. 15, 1924
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.40	3.40	3.40	3.75
Sheets, black, No. 28, Chicago dist. mill	3.60	3.60	3.70	...
Sheets, galv., No. 28, P'gh.	4.50	4.50	4.60	4.90
Sheets, galv., No. 28, Chicago dist. mill	4.70	4.70	4.85	...
Sheets, blue, 9 & 10, P'gh.	2.60	2.60	2.70	2.85
Sheets, blue, 9 & 10, Chicago dist. mill	2.70	2.70	2.80	...
Wire nails, Pittsburgh	2.85	2.85	2.85	3.00
Wire nails, Chicago dist. mill	2.95	2.95	2.95	...
Plain wire, Pittsburgh	2.60	2.60	2.60	2.75
Plain wire, Chicago dist. mill	2.70	2.70	2.70	...
Barbed wire, galv., P'gh.	3.55	3.55	3.55	3.80
Barbed wire, galv., Chicago dist. mill	3.65	3.65	3.65	...
Tin plate, 100 lb. box, P'gh.	$5.50	$5.50	$5.50	$5.50
Old Material,				
Carwheels, Chicago	$16.00	$16.00	$17.00	$17.00
Carwheels, Philadelphia	18.00	18.00	18.50	17.50
Heavy steel scrap, P'gh.	*17.00*	17.50	19.00	16.00
Heavy steel scrap, Phila.	*14.50*	15.00	16.00	15.00
Heavy steel scrap, Ch'go	*14.75*	15.00	16.50	14.00
No. 1 cast, Pittsburgh	18.00	18.00	19.00	18.50
No. 1 cast, Philadelphia	17.50	17.50	18.00	18.00
No. 1 cast, Ch'go (net ton)	17.50	17.50	18.00	18.50
No. 1 RR. wrot, Phila.	18.00	18.00	19.00	18.50
No. 1 RR. wrot. Ch'go (net)	13.00	13.00	14.50	12.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	*$3.00*	$3.15	$3.25	$3.75
Foundry coke, prompt	4.00	4.00	4.25	4.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.75	13.75	14.62½	13.62½
Electrolytic copper, refinery	13.37½	13.37½	14.25	13.25
Zinc, St. Louis	7.12½	7.10	7.32½	6.07½
Zinc, New York	7.47½	7.45	7.67½	6.42½
Lead, St. Louis	7.70	7.87½	8.72½	7.75
Lead, New York	8.05	8.20	9.00	8.12½
Tin (Straits), New York	50.00	51.30	53.00	49.25
Antimony (Asiatic), N. Y.	13.50	13.75	15.75	10.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

THE IRON AGE Composite Prices

April 14, 1925, Finished Steel, 2.531c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

April 7, 1925,	2.531c.
March 17, 1925,	2.531c.
April 15, 1924,	2.703c.
10-year pre-war average,	1.689c.

April 14, 1925, Pig Iron, $21.04 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

April 7, 1925,	$21.29
March 17, 1925,	22.13
April 15, 1924,	22.50
10-year pre-war average,	15.72

	High				Low		
	1923	1924	1925		1925	1924	1923
Finished Steel	2.824c., April 24	2.789c., Jan. 15	2.560c., Jan. 6		2.531c., March 17	2.460c., Oct. 14	2.446c., Jan. 2
Pig Iron	$30.86, March 20	$22.88, Feb. 26	$22.50, Jan. 13		$21.04, April 14	$19.21, Nov. 3	$20.77, Nov. 20

naces in the past week and has ordered three others to go on the idle list. This curtailment will leave that company with 39 of 58 blast furnaces in production, three of which are on ferromanganese. At its recent peak this company had 48 blast furnaces in production. Ingot production of the company is estimated at slightly under 85 per cent for this week. Independent companies also have lost ground in the past week and the average ingot production of those in this and nearby districts now is below 75 per cent of capacity.

Despite the recession in orders and production, however, manufacturers still are confident that the year as a whole will prove to be a good one. What has happened in the past few weeks is regarded as merely an adjustment made necessary by the fact that ideas as to the business prospects for the year changed very materially after the turn of the year from those held just after the Presidential election. It is held that the railroads have not yet embarked on their equipment program and that unless the country's crops turn out much smaller than they now promise to, some extensive car purchases will be necessary. There is also the possibility that the movement of ore will be stimulated by the low prices recently announced and that this may mean additional car purchases. The automobile industry is getting large orders for cars and having been a sparing buyer of steel, is counted upon to provide much business. The agricultural industry also is figured as a

larger steel outlet than it has been in recent years, as signs point to more export business in farm tools than in several years. Electrical development and the carrying of power long distances is mentioned as a future large outlet for steel in the shape of transmission towers, which average six tons each.

The recent ore price reduction still occasions mixed views as to its ultimate defects. Some merchant pig iron producers, who are not interested in the mines, feel that their ore costs now are as low and possibly lower than those of the steel companies owning ore mines and that this will mean less competition from the steel companies in the merchant pig iron market. This idea, however, is not generally accepted and it is pointed out that the advantage enjoyed by steel companies in the matter of pig iron producing costs is largely from cheap fuel costs due to the operation of by-product coke plants. It is felt that a number of ore companies will be unable to operate at the new prices and that those that stay in production and whose returns are affected by the new scale of prices will lose further from the fact that the present indications are that there is going to be no reduction in the Lake shipping rates on ore.

Pig Iron.—Another cut of 50c. a ton has been made in prices of all grades of pig iron. This reduction to a large extent is merely the passing on by producers of the lower costs allowed by the decline in coke and the recent reduction in ore prices. Sales have been few and interest on the part of melters still is low. An Allegheny Valley sheet maker is credited with having purchased a round tonnage of basic iron at a price that figures out $20, Valley furnace, and paid $21, Valley furnace, for 500 tons of Bessemer iron. Basic iron is readily available at $20 from Valley furnaces and that price also has been quoted on No. 2 foundry by Valley producers. The most recent sale of malleable iron was at $20.50, Valley furnace. The market at its present level is $2 to $2.50 a ton below the top prices of the early part of the year, but buyers do not yet appear to be interested in additional supplies, not that there has been a lack of consumption, but rather because they feel safe in liquidating their stocks in the belief that they will replace them as cheaply as they bought them.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$20.00
Bessemer	21.00
Gray forge	$19.50 to 20.00
No. 2 foundry	20.00 to 20.50
No. 3 foundry	19.50 to 20.00
Malleable	20.50
Low phosphorus copper free	28.50

Ferroalloys.—New business is quiet, as with decreasing steel works operations shipments against contracts are proving ample for all requirements. Prices are unchanged, but they are untested by demand. They are given on page 1163.

Semi-Finished Steel.—The matter of second quarter prices on billets, slabs and sheet bars having been settled, the market has lapsed in point of interest and of activity. Sheet and strip mills are not running so heavily that full quota specifications are necessary and demand is further halted by the fact that most strip makers who do not make their own steel had a good deal of steel in stock at the opening of the quarter. The market is quotable at $37, Pittsburgh or Youngstown, for sheet bars and at $35.50 for 4-in. billets and slabs of equivalent dimensions, but those prices are not being very heavily tested. Wire rods are slow, but the price appears to be holding well at $48, base, Pittsburge or Cleveland. Skelp still is quoted at 2c. to 2.10c., but actual business is light. The Carnegie Steel Co. still is producing ingots at well above 80 per cent of capacity, but the average of independents in this and nearby districts is about 75 per cent. Prices are given on page 1163.

Wire Products.—Shipments against old orders are good, but new business is much lighter than it was recently and producers find their backlogs melting away rather rapidly. The hope is that consumption is larger than current demands and that before midsummer buying will again be on an increasing scale. Price irregularity continues in nails, but the market is making a good showing on plain wire and the other wire products. Nails are not firm at $2.85, base, per keg, Pittsburgh, for bright ones and coated nails also are subject to some price shading. Plain wire, on the other hand, is well established at $2.60, base, per 100 lb., Pittsburgh. Prices are given on page 1162.

Rails and Track Supplies.—New business is distinctly quiet in railroad spikes and track supplies, but there is still fairly good specifying against old orders. Prices show no particular change, but are untested. Light rails are quoted at 1.80c., base, mill, for billet rails, but there is not enough demand to prove that this price is other than an appraisal of the manufacturers. Prices are given on page 1162.

Tubular Goods.—While there is little or no forward buying of pipe, the daily run of orders reaches a fairly large total and by laying aside some stock the mills in this district are able to maintain an economical rate of operations. Jobbers now have the assurance of getting as much pipe as they want and getting it promptly; consequently, they are buying closer to actual needs than they did in former years and since there is no apparent possibility of higher prices in the near future, another reason for buying ahead is removed. There is a fairly good demand for boiler tubes, but it is not sufficiently strong to justify higher prices than have hitherto prevailed. Discounts are given on page 1162.

Sheets.—This branch of the steel industry still is having quiet times, although the fact that the American Sheet & Tin Plate Co. is getting an increasing number of telegraphic requests for tonnage would suggest that some consumers were either having larger demands or that they had disposed of their stocks more rapidly than they expected a short time ago. Some of these telegraphed orders are for export and, calling chiefly for galvanized sheets to be delivered at the Atlantic seaboard by May 2, will mean some speeding up of operations. Generally, the industry is producing at between 65 and 70 per cent of capacity. Possibly, shading of quotations is not as general as it was recently, but the market cannot yet be said to be really stronger than it has been. There was overproduction in the first quarter and it probably will take a little time to correct the supply situation. Prices are given on page 1162.

Tin Plate.—An announcement of third quarter and last half prices of tin plate probably will be made by the American Sheet & Tin Plate Co. next week. That company now knows the requirements of its principal customers to the end of the third quarter and only the detail of price remains to be settled. In the industry at large the impression prevails that the present price will continue, since sheet bars have not maintained the advance of the early part of the year and the price of pig tin is not too high to permit of profits at the present price of tin plate. The signs still point to a big fruit and vegetable crop and to a heavy pack, with the consequent heavy consumption of tin plate. Mill operations hold at between 85 and 90 per cent of capacity and that rate is based largely on actual orders.

Cold-Finished Steel Bars and Shafting.—The past week has been marked by some falling away in demand, but all makers report good shipments and it is noted that the week's recession in buying from the previous week is slight compared with those in the fore part of last month. There is still a quotation of 2.80c., base, Pittsburgh, but in a general way 2.70c., base, is a more representative price on the general run of orders. There is no tendency to reflect in the cold-finished steel bar price the extra of $2 per ton on hot-rolled bars of screw stock analysis; no great tonnages of hot-rolled bars carrying the extra are yet moving and demand for cold-finished bars is hardly strong enough yet to permit the extra charge.

Steel and Iron Bars.—Specifications on contracts are reasonably good, but new business is light. The market is holding well at 2.10c. base, Pittsburgh, but the test of large demand is lacking. Iron bars also are steady. Prices are given on page 1162.

Structural Material.—While demand is slower in the other lines, it has held up rather well in structural

steel, and on the business coming out in this territory there has been no shading of prices. The Carnegie Steel Co. will furnish 3000 tons of sheet piling for three river dams to be built under the direction of the U. S. Engineer's Office, Louisville. This steel will be shipped by river. Prices are given on page 1162.

Plates.—New business being much lighter than shipments, there are more mills that need business, and the price situation is not overly strong. The common quotation on small lots is 2.10c. base, Pittsburgh, but that now is really a single carload price. Prices are given on page 1162.

Hot-Rolled Flats.—The market lacks activity, but is holding rather well on material up to 6 in. wide. Stock from 6 to 12 in. is quoted at 2.20c. base, Pittsburgh, but on material wider than 12 in. there is increasing tendency to quote the plate base. Prices are given on page 1162.

Cold-Rolled Strips.—While a good many makers complain that 4c. base, Pittsburgh, allows little or no profits, the demand is hardly strong enough to sustain a higher figure. The American Steel & Wire Co. now is accepting business at 4c. base, Pittsburgh, although it does not produce cold-rolled strips at any of its Pittsburgh district plants.

Bolts, Nuts and Rivets.—Buyers are still pursuing a hand-to-mouth policy and while the total purchases reach a fairly good aggregate, makers are meeting all demands promptly and are unable to accumulate any backlog business. Prices are steady, except that occasionally an order for large rivets for early delivery of a size a little larger than the general run goes at concessions of as much as $2 a ton. Prices and discounts are given on page 1163.

Old Material.—Prices still are sagging, more from the lack of demand than because of the weight of offerings. No. 1 heavy melting steel can be had at $17.50 and on the general run of material of that grade the market no longer is quotable above $17. Dealers are able to buy some lots as low at $16.50, but usually it is a small lot that has to be sold. Industrial companies that have storage space are not pressing scrap on the market at present prices. Consumers can be induced to buy only when the material is up to grade and the price low enough to bring down the buyer's average. Prices are not low enough to encourage dealers to lay down material on their yards. There is neither consumptive buying nor purchasing by dealers and those who have scrap they must sell have an unpleasant time finding an outlet. The Norfolk & Western Railway is offering 10,532 gross tons in its April scrap list.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton

Heavy melting steel	$17.00 to $17.50
No. 1 cast, cupola size	18.00 to 18.50
Rail for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	18.50 to 19.00
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	19.50 to 20.00
Railroad coil and leaf springs	19.50 to 20.00
Low phosphorus blooms and billet ends	22.00 to 22.50
Low phosphorus plate and other material	20.50 to 21.00
Railroad malleable	17.50 to 18.00
Steel car axles	20.50 to 21.00
Cast iron wheels	18.00 to 18.50
Rolled steel wheels	19.50 to 20.00
Machine shop turnings	13.50 to 14.00
Short shoveling turnings	13.50 to 14.00
Sheet bar crops	20.00 to 20.50
Heavy steel axle turnings	17.50 to 18.00
Short mixed borings and turnings	13.50 to 14.00
Heavy breakable cast	15.00 to 15.50
Stove plate	14.50 to 15.00
Cast iron borings	13.50 to 14.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	17.00 to 17.50

Coke and Coal.—Curtailment of coke production evidently is not as rapid as the decline in the demand and prices still are easy and actually lower on furnace grade. On contracts for shipment over the remainder of the present quarter, furnace coke is priced at $3.25 per net ton at ovens, and a contract is under negotiation for a good sized monthly tonnage for shipment over the remainder of the year that has brought out a quotation that averages slightly under $3.50. On spot tonnages, however, the market is no longer quotable above $3.15 and sales have been made as low as $3. Spot foundry coke still is quoted at $4 to $4.50, but the outside quotation is becoming exceptional. No improvement can be chronicled of the coal market either as to prices or demand.

Canadian Scrap Market Develops Weakness

TORONTO, ONT.—Continued weakness in the demand for iron and steel scrap has resulted in Toronto dealers reducing their buying prices on some commodities. Interest in heavy melting steel has fallen off and about the only demand for this material at the present time is from consumers in the Hamilton, Ont., district. Turnings are also in less demand than formerly and dealers are now offering $12 for heavy melting steel and $10 for turnings, delivered Toronto. No. 1 machinery cast has been reduced $1 per net ton, with dealers now offering $17 for this material in large quantities. While other commodities have not been affected by the reductions, it is expected that further changes will be announced in the not distant future, both in Toronto and Montreal price lists. A softening undercurrent is appearing in prices. Dealers' buying prices are as follows:

	Toronto	Montreal
Gross Tons		
Steel turnings	$10.00	$10.00
Machine shop turnings	10.00	9.00
Wrought pipe	7.00	8.00
No. 1 wrought scrap	13.00	13.00
Heavy melting steel	12.00	12.00
Steel axles	16.00	18.00
Axles, wrought iron	18.00	20.00
Net Tons		
Standard car wheels	16.00	16.00
Malleable scrap	14.00	15.00
Stove plate	14.00	13.00
No. 1 machinery cast	17.00	18.00

Heavy Melt of Pig Iron at Detroit—Scrap Is Weak

DETROIT, April 14.—The melt in the district is very high, with more pig iron being consumed than any month since March, 1924.

Further declines have been registered in the scrap market in this district, due primarily to hold orders from mills and furnaces on present contracts, and this stagnation has been supplemented by very few sales being made during the past week.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	$13.50 to $14.50
Borings and short turnings	10.50 to 11.50
Long turnings	10.00 to 11.00
No. 1 machinery cast	15.00 to 17.00
Automobile cast	20.00 to 21.00
Hydraulic compressed	11.00 to 12.00
Stove plate	14.50 to 15.50
No. 1 busheling	11.00 to 12.00
Sheet clippings	9.00 to 10.00
Flashings	10.00 to 11.00

A grand total of $44,456,918 in building permits was issued during March in 79 cities of the seven Pacific Coast States, which is the highest monthly total since March of last year. This figure shows a 12 per cent gain over the total for February, but a 16 per cent reduction from the figure of last March and an 11 per cent reduction from the March total of 1923.

Decided improvement in the employment situation in Milwaukee industries, especially foundries and machine shops, is reported by the free employment office. The number reported employed by 50 typical industries on April 1 was the highest in a year's time, being 32,257, or 907 more than on March 1. At present employment is only 10 per cent below the peak condition in the summer of 1923.

Chicago

Uncertainty as to Railroad Buying—Automobile Output Large

CHICAGO, April 14.—That railroad buying will exert an important, and possibly a determining influence, on the future course of the iron and steel market is a view which is gaining ground in Western circles. The dearth of car orders during the past two months and the decline in freight traffic on certain Northwestern lines has recently been cause for concern, but late developments are more reassuring. Revenue freight car loadings for the entire country during the first quarter were the largest for any corresponding period in history. Moreover this record was made despite the fact that loadings of coal have been lower than in past years. Another encouraging omen is the fact that the Pennsylvania has authorized a five year improvement program calling for the expenditure of $100,000,000 announced last week in THE IRON AGE. Of more immediate import is the placing of 700 cars by the Atlantic Coast Line following the Southern Pacific purchase of 3400 cars last week, and the issuance today by the receiver of the Chicago, Milwaukee & St. Paul of an inquiry for 5500 cars. Other roads are contemplating entering the market, among them the Wabash, which is expected to ask for figures on 1800 cars.

Improvement in automobile output has exceeded expectations. In fact, a number of foundries serving the motor car industry have found it necessary to farm out part of their work. The only misgiving entertained in regard to the present activity among automobile manufacturers is that it may prove short-lived.

Consumers, who still have steel on order at lower prices are confident that they will be able to buy at $2 a ton below the current quotations. Meanwhile actual new business is too restricted to put the market to a real test. At the same time, the pressure for business by Ohio and Pennsylvania mills shows no relaxation. In fact, on structural shapes as low as 1.95c., Pittsburgh, or 2.29c., delivered Chicago, has been quoted.

Local steel plant operations are showing the effects of curtailed buying. The blowing out of a blast furnace at South Chicago and another at Joliet has reduced the number of active steel works stacks in this district to 30 out of a total of 35. Thus far four furnaces have gone out since peak operations were reached last quarter. Steel ingot output, however, is still close to 100 per cent of capacity.

Pig Iron.—In a quiet market the price situation has shown no further change. Nothing lower than $23 base, furnace, has been reported on Northern iron and in some instances as high as $23.50 has been paid. Buyers are unusually apathetic; in fact, there is no indication on their part that price concessions would induce them to place further business at this time. While melt in this district is well maintained, foundries are not booked far enough ahead to anticipate their wants with any degree of assurance. However, the increase in melt among foundries serving the automobile industry has exceeded expectations. In western Michigan a number of larger melters have found it necessary to farm out part of their work. In Wisconsin the Nash Motors Co. is producing at a record rate and is reported to be ten weeks behind on its orders. Racine melters are busy on castings for the Ajax Motor Co., a Nash subsidiary, which will commence assembling cars about May 1. The tractor and farm implement industries are still busy and foundries making radiators, sanitary ware and other household appurtenances reflect sustained activity in building construction. Railroad equipment makers are operating on curtailed schedules, but a revival in car buying appears to be at hand. A Western railroad is inquiring for 400 tons of foundry iron for the current quarter. Other inquiries include 1000 tons of foundry wanted by an Indiana melter, 500 tons of foundry asked for by a Chicago user, and 200 tons for a Michigan plant, all for second quarter shipment. A Milwaukee and a Chicago melter have each closed for 150 tons of foundry. Shipments from local furnaces have shown very little recession and it is said that accumulations of blast furnace yards do not exceed 25,000 tons. One producing interest remains several weeks behind on its deliveries. Offerings of resale iron are almost negligible. Sales of Southern foundry in this territory have been notably few. A local inquiry for charcoal calls for 300 tons. A Michigan automobile maker is in the market for 500 tons of 14 to 16 per cent ferrosilicon.

Quotations on Northern foundry, high phosphorus, malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	$23.00 to $23.50
Northern No. 1 foundry, sil. 2.25 to 2.75	23.50 to 24.50
Malleable, not over 2.25 sil.	23.00 to 23.50
Basic	23.00 to 23.50
High phosphorus	23.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	25.68
Southern No. 2, sil. 1.75 to 2.25	24.51 to 26.01
Low phos., sil. 1 to 2 per cent, copper free	32.65
Silvery, sil. 8 per cent	34.29
Electric ferrosilicon, 14 to 16 per cent	45.00

Ferroalloys.—Spiegeleisen has declined on a sale of 250 tons.

We quote 80 per cent ferromanganese, $122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, $85, delivered; spiegeleisen, 18 to 22 per cent, $40.04 to $40.58, delivered.

Plates.—Twenty-two hundred freight cars placed by the Southern Pacific with the Standard Steel Car Co. will be built at Hammond, Ind., and the steel required, 20,000 tons, has been ordered from a leading local mill. The Wabash is inquiring for a ferryboat, calling for 3500 tons, and the Standard Oil Co. of Indiana is in the market for stills for Casper, Wyo., 1500 tons. The St. Louis Southwestern is asking for quotations on oil storage tanks for Texas, requiring 700 tons. In the aggregate, new business in plates is light and local mill operations are intermittent. Competition from Eastern mills is still severe, but in the absence of active demand local quotations remain unchanged.

The mill quotation is 2.30c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Structural Material.—Structural awards are light and many fabricating shops have largely disposed of their back orders and are now in need of tonnage. Considerable building work is in prospect, but it is slow in reaching the active stage. The placing of the general contract for the Stevens Hotel, Chicago, with George A. Fuller Co., confirms the contingent award of the steel, 18,000 tons, to the American Bridge Co. Most fabricators still have material in stock or on order at lower than present prices, and in view of the paucity of new buying, plain material quotations are largely untested.

The mill quotation on plain material is 2.30c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bars.—New business in soft steel bars has declined and current specifications received by a leading local mill no longer exceed shipments, notwithstanding the fact that commitments in bars are heavier than in most other finished steel commodities. Some Western producers are in need of fresh tonnage and the competition of mills east of here shows no relaxation. The foremost local mills, however, have not abandoned their quotation of 2.20c., Chicago, although a relatively small proportion of the tonnage on their books has been taken since the price was advanced to that figure in February. Among favorable developments may be mentioned heavier specifications from farm implement and tractor manufacturers.

Mill prices are: Mild steel bars, 2.20c.; common bar iron, 2.10c., Chicago; rail steel, 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.70c.

Sheets.—The volume of both new business and specifications is unsatisfactory, making mill operations uncertain. Here and there is to be noted some evidence of a revival of demand, but it is by no means conclusive. Prices remain weak. Notwithstanding lagging specifications, a Western independent started out the week with all of its hot mills running.

Chicago delivered prices from mill are 3.65c. for No. 28 black, 2.75c. to 2.85c. for No. 10 blue annealed and 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Wire Products.—Prices are in a state of flux and it is difficult to put one's finger on ruling market quotations. The best that can be said is that prices have grown no weaker. In the meantime jobbers are moving their stocks more rapidly, with the result that mills are receiving slightly heavier specifications. For mill prices see page 1162.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, $3.15 for 100 lb.; common wire nails, $3.25 per keg; cement coated nails, $2.55.

Rails and Track Supplies.—Various orders for tie plates booked during the week aggregate 3500 tons. Railroads are specifying generously against their rail and fastening contracts and in most instances want deliveries a little faster than the mills can make them. This is not surprising in view of the fact that this is the season when railroad track work is undertaken in earnest.

Standard Bessemer and Open-hearth rails, $43; light rails, rolled from billets, 1.90c. to 2c., f.o.b. makers' mill.

Standard railroad spikes, 3c. mill; track bolts with square nuts, 4c. mill; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c. f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts, 4.55c. base.

Cast Iron Pipe.—Detroit has not yet set a date on which it will receive revised bids on the 12,865 tons which have been up for figures twice within the past two months. Jackson, Mich., has awarded 785 tons to James B. Clow & Sons. The National Cast Iron Pipe Co. will supply 400 tons for Waukegan, Ill. The United States Cast Iron Pipe & Foundry Co. will furnish 1400 tons for Mahoning County, Ohio. Kuehn Bros., Aurora, Ill., have the general contract for 1000 tons for Riverside, Ill. Menominee Falls, Wis., took general contract figures on 350 tons yesterday.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $50.70 to $52.26; 6-in. and over, $46.70 to $48.20; Class A and gas pipe, $4 extra.

Bolts, Nuts and Rivets.—Specifications are considered satisfactory for this stage of the second quarter, but new business is still light. The price situation is holding rather steadily, although occasional reports of concessions are heard. On large machine bolts a large quantity in the Southwest brought out a quotation of 60 and 10 and 5 off, Chicago. At a northwestern point 60 and 10 off delivered was quoted.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to ⅞ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to ⅞ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squares, tapped or blank, $3.50 off; hot pressed nuts, hexagons, tapped or blank, $4 off; coach or lag screws, 60 per cent off.

Cold-Finished Steel Bars.—This commodity is now quoted at 2.70c. to 2.80c. base, Chicago. Business from the automobile industry has shown marked improvement.

Cold-Rolled Strip.—With this commodity quoted at 4c. base, Cleveland and Pittsburgh, the range in local prices is from 4.30c. to 4.34c.

Hot-Rolled Strip.—Local prices range from 2.55c. to 2.60c., with business picking up owing to the revival of activity in the automobile industry.

Reinforcing Bars.—Building activity continues to gain momentum, expediting the closing of contracts and the submission of new work for bids. The general contract for the Stevens Hotel, Chicago, requiring 1600 tons of concrete bars, is reported to have been awarded to the George A. Fuller Co. Northwestern University has issued plans covering a downtown campus at Chicago Avenue and Lake Michigan which will require a large tonnage of bars. It is also asking figures on eight sorority and fraternity houses at Evanston, Ill., requiring approximately 50 tons of reinforcing bars each. Hospital and laboratory buildings for the University of Chicago, Chicago, will call for 1400 tons of reinforcing bars instead of 700 tons, as previously reported. It develops that the Great Northern did not purchase 200 tons for delivery at Duluth from the Jones & Laughlin Steel Corporation, as reported in the issue of April 2.

Lettings include:

U. S. Veterans' Hospital, Great Lakes, Ill., 500 tons to Concrete Engineering Co.

Illinois Central Railroad, Sixty-seventh Street undercrossing, Chicago, 350 tons to Concrete Steel Co.

Bobinsky apartments, Chicago, 250 tons of rail steel to Inland Steel Co.

Grand Manor Apartment, Milwaukee, 200 tons to American System of Reinforcing.

Haglin Building, Chicago, 170 tons to Concrete Steel Co.

Public school, Sixty-sixth Street and Richmond Avenue, Chicago, 160 tons to Olney J. Dean & Co.

Western News Co. building, Chicago, 150 tons of rail steel to Inland Steel Co.

Morton High School, Cicero, Ill., 100 tons to Concrete Engineering Co.

Pending work includes:

Hospital and laboratory buildings, University of Chicago, Chicago, 1400 tons, general contract figures not yet taken.

Northwestern University, Evanston, eight sorority and fraternity houses, 400 tons.

Chemical house, Minneapolis water department, 750 tons.

High school building, Eau Claire, Wis., 450 tons.

Section B of sewer, St. Paul, Minn., 500 tons, all bids rejected for third time.

Park Shore apartment hotel, Chicago, 160 tons, general contract awarded to John A. Lundstrum.

Twelfth Church of Christ, Scientist, Chicago, 100 tons.

Old Material.—Although the market is still weak, price recessions are few and it is beginning to appear as if a point of resistance had been reached. On the one hand purchases by dealers to fill expiring orders are having a sustaining influence on prices and on the other hand there is less disposition to sell short because of the present low level of the market. Scrap yard operations have been sharply curtailed because present prices do not warrant the expense of handling and sorting. Shipments of country scrap have almost ceased owing to the low net return to country dealers after deducting handling and freight charges. The most recent consumer purchase of heavy melting, a few thousand tons, brought out a price of $15.25 delivered, a decline of 25c. a ton. Railroad offerings include the Santa Fe, 3300 tons; the Chesapeake & Ohio, 14,200 tons, and the Soo Line, 400 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$17.00 to $17.50
Cast iron car wheels	16.00 to 16.50
Relaying rails, 56 and 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	18.00 to 18.50
Railroad tires, charging box size	18.00 to 18.50
Railroad leaf springs, cut apart	18.00 to 18.50
Rails for rolling	16.00 to 16.50
Steel rails, less than 3 ft.	17.50 to 18.00
Heavy melting steel	14.75 to 15.25
Frogs, switches and guards cut apart	15.25 to 15.75
Shoveling steel	14.50 to 15.00
Drop forge flashings	11.00 to 11.50
Hydraulic compressed sheets	12.50 to 13.00
Axle turnings	13.50 to 14.00
Steel angle bars	16.50 to 17.00
Steel knuckles and couplers	17.50 to 18.00
Coil springs	19.00 to 19.50
Low phos. punchings	17.00 to 17.50
Machine shop turnings	10.00 to 10.50
Cast borings	11.00 to 11.50
Short shoveling turnings	11.00 to 11.50
Railroad malleable	17.50 to 18.00
Agricultural malleable	16.50 to 17.00
Per Net Ton	
Iron angle and splice bars	17.00 to 17.50
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	25.50 to 26.00
Steel car axles	16.00 to 16.50
No. 1 busheling	11.50 to 12.00
No. 2 busheling	8.50 to 9.00
Pipes and flues	9.50 to 10.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.50 to 14.00
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	15.50 to 16.00
No. 1 agricultural cast	15.50 to 16.00
Locomotive tires, smooth	16.00 to 16.50
Stove plate	13.25 to 13.75
Grate bars	13.00 to 13.50
Brake shoes	13.00 to 13.50

New York

Standard Oil Co. in Market for Tin Plate —Steel Specifications Heavier

NEW YORK, April 14.—The most favorable feature of the pig iron market is increased interest on the part of some buyers and insistence in many cases upon prompt deliveries of new purchases. It is evident that buyers have been staying out of the market as long as possible in the hope of obtaining lower prices, and when some of them come into the market they require immediate delivery. Sales during the past week amounted to about 10,000 tons, the largest transaction made public being a purchase of 1200 tons by the New York Central for second quarter delivery. Pending inquiry is light and the market is not strong. In the Buffalo district little attention is being paid to differentials and in some cases No. 2X has been sold at $20.25, the same price at which No. 2 plain is being sold. Low prices are made for delivery in New England and somewhat higher prices are paid for delivery in the immediate Buffalo district. Sales of foreign iron are not numerous and are being made on about the same basis as those of domestic grades. There does not seem to be much chance of foreign irons competing successfully in the domestic market, but considerable iron bought some time ago in foreign countries remains to be delivered.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25..	$24.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	25.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	25.02
Buffalo, sil. 1.75 to 2.25.....$24.91 to	25.91
No. 2 Virginia, sil. 1.75 to 2.25..	29.44

Ferroalloys.—One British representative reports the sale of two lots of ferromanganese amounting to 400 to 500 tons and others state that there have been both inquiries and sales for carload and small lots, all wanted for early shipment. Some consumers are even urging earlier shipments on contract. All the business done has been at the full price of $115, seaboard basis. Sales and inquiries for several small lots of spiegeleisen are also noted at the prevailing prices.

Cast Iron Pipe.—On all but the large municipal lettings of gas and water pipe, when competition is keen, the current market price is fairly firm. Makers are well booked with business on most sizes. The 12,000 tons of pipe for Oneida, N. Y., bids on which were opened a second time, has been awarded again to the Pont-a-Mousson works, the French cast iron pipe maker. The first shipment of this order is expected by the seller to leave Antwerp this week. Most of the activity in bell and spigot pipe at present is in small lots to private purchasers. The soil pipe market is still inactive and prices are no more than holding their own, with the prospect in view of a still further increase in discounts before long unless business shows an increase.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $52.60 to $53.60; 4-in. and 5-in., $57.60 to $58.60; 3-in., $67.60 to $68.60, with $5 additional for Class A and gas pipe. Discounts on both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 40 to 41¼ per cent off list; heavy, 50 to 51¼ per cent off list.

Warehouse Business.—Developments of the week showed a somewhat better movement in the general line and an appreciable firming of prices. In structural steel, activity was especially good. Sheets, bars and pipe moved in fair volume. Export inquiry has become lively and some large orders have been taken for Cuba, South and Central America. There has been more demand for Swedish charcoal iron bars and good grades are had at around 7c., base. We quote boiler tubes per 100 ft. as follows:

Lapwelded steel tubes, 2-in., $17.33; seamless steel, 2-in., $20.24; charcoal iron, 2-in., $25; 4-in., $67.

Finished Iron and Steel.—Specifications received at local sales offices of steel companies have been slightly better for the first two weeks of April than for the same period in March. This is quite a general situation with the possible exception of plates, orders for which are still lagging. The plate price, which has been held quite firmly at a 2c., Pittsburgh base, has now broken through that figure and sales have been made at 1.95c. On 10 tons of flange steel for the Tompkinsville lighthouse, Staten Island, the United States Department of Commerce received bids of 2.55c. and 2.60c., delivered, the former price figuring 1.95c., Pittsburgh, when deductions have been made for extras and freight rate. The order went to an eastern Pennsylvania plate mill. Structural steel lettings are in fairly good volume, the total work in New York City alone for a week being 25,000 to 30,000 tons, this including the New York Edison Co. power plant, let to Post & McCord and the American Bridge Co., which will require 15,000 to 20,000 tons. The New York *Evening Post* Building, taking 4000 tons, and a loft building of 3000 tons were also awarded. Building construction involving use of concrete reinforcing bars is disappointing to the companies which specialize in these bars, prospects being reported as less encouraging than they were a month ago. The lighter rolled products show some gains in demand and consumption keeps up at a good pace. Inquiries for sheets are larger, but the price situation is still very irregular, blue annealed sheets going at 2.50c. to 2.60c., black at 3.40c. and galvanized at 4.50c. to 4.60c., Pittsburgh. Hot rolled strip steel is in fair demand, and at least one mill was unwilling to accept an order for 300 tons of narrow gage material at 2.40c., Pittsburgh. Fairly prompt deliveries are to be had on nearly all steel products, though blue annealed sheets and hot rolled strips are sometimes quoted for shipment in four to six weeks. One of the most important items of the week is an inquiry from the Standard Oil Co. of New Jersey for 150,000 boxes of tin plate.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.44c.; plates, 2.34c.; structural shapes, 2.34c.

Old Material.—With the exception of heavy melting steel, which is fairly steady at $14.50 to $15 per ton, delivered eastern Pennsylvania, the buying price of brokers, most grades are continuing to sag. Heavy melting steel activity is largely confined to shipments to Bethlehem and Conshohocken, Pa. Borings and turnings, generally bought by brokers for shipment to Bethlehem, are off $1, only $11.50 per ton delivered being paid. Machine shop turnings are off 50c. per ton, dealers offering $12 delivered Phoenixville, with $12 for bundled sheets and $12.50 for stove plate on this delivery. Stove plate is also being bought at $12.50 per ton, delivered West Mah Wah, N. J., which takes a $2.02 instead of $3.50 freight rate from New York. Specification pipe is off $1 a ton, brokers offering $14.50, delivered Lebanon. The chemical boring market has weakened considerably and brokers are not paying more than $14 to $14.50 per ton, New York. Heavy breakable cast is off about 50c. per ton. The market as a whole is so inactive, even the transactions reported being small, that it is difficult to establish more than a nominal price in many instances.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....$10.50 to	$11.00
Heavy melting steel, railroad or equivalent ..... 11.50 to	12.00
Rails for rolling ..... 12.75 to	13.25
Relaying rails, nominal ..... 24.00 to	25.00
Steel car axles ..... 18.00 to	18.50
Iron car axles ..... 24.00 to	24.50
No. 1 railroad wrought ..... 14.00 to	14.50
Forge fire	10.00
No. 1 yard wrought, long ..... 13.00 to	13.50
Cast borings (steel mill)..... 8.50 to	9.00
Cast borings (chemical)..... 14.00 to	14.50
Machine shop turnings..... 8.50 to	9.00
Mixed borings and turnings..... 8.00 to	9.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)..... 10.25 to	10.75
Stove plate ..... 9.00 to	10.50
Locomotive grate bars ..... 11.50 to	12.00
Malleable cast (railroad) ..... 14.00 to	14.50
Cast iron car wheels ..... 13.00 to	13.50
No. 1 heavy breakable cast..... 11.50 to	12.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast .....$15.00 to	$15.50
No. 1 heavy cast (columns, building material, etc.), cupola size 13.00 to	13.50
No. 2 cast (radiators, cast boilers, etc.) ..... 12.00 to	12.50

Buffalo

Keen Competition in New England on Pig Iron and Low Prices Made

BUFFALO, April 14.—While some Buffalo furnaces are attempting to maintain the $21 base, softened market conditions have induced lower prices and in many quotations the differentials have been almost discarded. On No. 2 plain and even on No. 2X $20 to $20.25 has been done. The inquiry for past week was not large, about 7500 tons, including 1000 tons of malleable for a Western melter and 1000 tons of foundry for an Eastern melter, neither of which is likely to be placed with a Buffalo furnace. There is a 600-ton foundry inquiry from the Middle West and two 500-ton foundry inquiries and a 400-ton lot. Two others are for 250 tons of foundry each. Furnacemen state that the competition of the foreign iron in the New England market is making for a weaker price there on Buffalo iron than prevails inland. Thus there are really two prices on Buffalo iron, one in New England and one in what is strictly the Buffalo district. In this connection a Buffalo furnace last week took a car of No. 1, silicon 2.75 to 3.25 at $22.50. We quote prices f.o.b. gross ton, Buffalo, as follows:

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25	$20.00 to $21.00
No. 2X foundry, sil. 2.25 to 2.75	20.25 to 21.00
No. 1 foundry, sil. 2.75 to 3.25	21.00 to 22.00
Malleable, sil. up to 2.25	20.00 to 21.00
Basic	21.00
Lake Superior charcoal	29.23

Finished Iron and Steel.—The market is spotty with some weaker prices having been developed on some material. Carbon steel bars have been quoted at the Buffalo equivalent of 2c., Pittsburgh. This price has been made on sizable tonnage and in some cases where first quarter tonnage has overlapped. Part of a recent Ford order for bars is said to have come to a Buffalo mill. The 2.365c. Buffalo delivered price has not disappeared entirely. Sheets are not exhibiting firmness and buyers say that the Buffalo equivalent of 3.30c., Pittsburgh, on black sheets can be developed, though the Buffalo equivalent of 3.40c., Pittsburgh, is also being quoted in some cases. Automobile specifications are fairly heavy just now. The reinforcing bar market is better than a month ago and prices are firmer than in carbon bars. On Buffalo stock, the prevailing price is 2.75c. with 2.465c. on mill material.

Warehouse prices are being quoted as follows: Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.35c.; No. 10 blue annealed sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.80c.; cold rolled shapes, 4.65c.; cold rolled rounds, 4.20c.; wire nails, 4.00c.; black wire, 4.05c.

Old Material.—The only notable transaction of the week was the purchase by a Depew melter of a lot of heavy melting steel said to run about 3000 tons for a price reputed to be about $17. Another mill is picking up small lots of heavy melting steel when it is able to buy it cheap. The holding-up of shipments by three or four Valley consumers has thrown some heavy melting steel and hydraulic compressed sheets on the Buffalo market, though this has not brought the market down. Most of it was absorbed by dealers, though one local mill bought part of it. This mill has been offering $16.75 for heavy melting steel and $15.75 for hydraulic compressed sheets. One of the conditions that helps to hold up the heavy melting steel market is that some old orders are still out at $17 and $17.50 for May and June delivery.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	$16.75 to $17.50
Low phosphorus	18.50 to 19.50
No. 1 railroad wrought	14.00 to 14.50
Car wheels	17.50 to 18.00
Machine shop turnings	11.00 to 11.50
Cast iron borings	11.50 to 12.00
No. 1 busheling	14.50 to 15.00
Stove plate	14.50 to 15.00
Grate bars	12.50 to 13.00
Bundled sheets	11.50 to 12.00
Hydraulic compressed	15.25 to 15.75
Railroad malleable	17.00 to 17.50
No. 1 cast scrap	16.50 to 17.00
Iron axles	26.00 to 27.00
Steel axles	17.00 to 17.50

Birmingham

Slight Concessions in Pig Iron Prices Fail to Break the Deadlock

BIRMINGHAM, ALA., April 14.—The deadlock as to prices of pig iron continues, the large producers still adhering to recent quotations, while consumers assert they are entitled to large concessions. The buying continues light, the production in the Southern territory is unchanged, at maximum, and the melt is steady. The second quarter business, recently booked, is almost nothing, but the furnace interests still owe much iron to the consumers and are making steady shipments. One small furnace interest put up 2000 tons of iron at $1 to $2 reduction in quotations but this caused no activity or concern. A Tennessee furnace is selling iron at $18.50, Birmingham base. A little resale iron was also heard of in this district recently but this had very little effect. The output in Alabama, 253,820 tons in March, is the second largest month's output of the State. In May, 1917, the production was 259,126 tons.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	$20.00 to $22.00
No. 1 foundry, 2.25 to 2.75 sil.	20.50 to 22.50
Basic	20.00 to 22.00
Charcoal, warm blast	30.00

Steel.—The lull in the steel market is not reflected in production in this district by any means, plants of subsidiary companies of United States Steel Corporation going at around 90 to 100 per cent and the independent plant of Gulf States Steel Co. operating four out of its six open-hearth furnaces and all of its finishing mills. Soft steel bars, Birmingham, are quoted at 2.25c. to 2.35c.

Pipe.—The usual quotation for cast iron pressure pipe in this market is on a $40 per ton base, 6-in. and over, but reports are heard that $38.50 and $39 have been done. French pipe has taken some business from Alabama producers of pressure pipe. The understanding here is that one of the largest producers of pressure pipe will get into the small-sized pipe production. The McWane Cast Iron Pipe Co. is now making pressure pipe as small as 1¾ in.

Coke.—Independent coke producers in Alabama are selling their output freely, while the iron and steel companies have their plants going to capacity. Quotations are firm around $5 with now and then a small lot selling at $5.25 for beehive foundry coke.

Old Material.—Better feeling is noted in the scrap iron and steel market by reason of a new and large consumer, despite the fact that close quotations are required to get any of the business. Some quotations are weak but no changes are reported.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	14.00 to 15.00
Railroad wrought	13.00 to 14.00
Steel axles	18.00 to 19.00
Iron axles	19.00 to 20.00
Steel rails	14.00 to 15.00
No. 1 cast	17.00 to 17.50
Tramcar wheels	17.00 to 17.50
Car wheels	16.00 to 17.00
Stove plate	14.50 to 15.50
Machine shop turnings	8.00 to 9.00
Cast iron borings	8.00 to 9.00
Rails for rolling	16.50 to 17.00

St. Louis

Sale of Basic Only Pig Iron Transaction of Size—Scrap Is Weaker

ST. LOUIS, April 14.—The market for pig iron is extremely dull, the only sale of consequence made during the week being 1000 tons of basic for immediate shipment to an East Side melter. This was sold by the St. Louis Coke & Iron Co., who also sold 700 tons of foundry iron in lots of a carload up to 100 tons. There are no sizable inquiries pending. The volume of business received by the melters in the district dur-

ing the first quarter was not up to expectations, with the result that there is considerable tonnage carried over either in stock or contracted for. Hence no great amount of buying is expected soon. Northern iron is quoted nominally at $23 to $23.50, Chicago. The St. Louis Coke & Iron Co. has reduced its price $2 to $23 to $24, Granite City. A Tennessee furnace is still quoting $18.50, Birmingham, but other Southern makers have made no change in their price. The Rockwood furnace, which has been quoting $18.50, makes a high phosphorus iron not adaptable to all uses but highly satisfactory for stove and other plants making light castings.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago; $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City.

Northern fdy., sil. 1.75 to 2.25	$25.16 to $25.66
Northern malleable, sil. 1.75 to 2.25	25.56 to 26.16
Basic	25.56 to 26.16
Alabama fdy., sil. 1.75 to 2.25 (rail)	23.67 to 27.17
Alabama fdy., sil. 1.75 to 2.25 (rail and water)	25.28
Tennessee fdy., sil. 1.75 to 2.25	23.67
Granite City iron, sil. 1.75 to 2.25	23.81 to 24.81

Finished Iron and Steel.—The policy of buying from hand to mouth which has prevailed for several months continues in this district. Outside of cars, railroads are buying very little—one St. Louis road buying less than a carload of wheels during the week. The placing of 300 tons of structural steel by the Illinois Glass Co. with the Mississippi Valley Structural Steel Co. was the first business of that kind placed in more than a month, and fabricators generally report there is nothing in immediate sight. Drury College, Springfield, Mo., placed contracts which include 300 tons of reinforcing bars.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.80c.; galvanized steel sheets, No. 28, 5.80c.; blank corrugated sheets, 4.95c.; galvanized, 5.95c.; cold-rolled rounds, shafting and screw stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, ⅞ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, $3.50; hexagons, blank or tapped, $4 off list.

Coke.—Foundry and metallurgical coke is moving in good proportions. Sales are being made almost entirely by by-product ovens in this district—very little coming in from the beehive district.

Old Material.—The market for old material continues its downward movement, declines during the last week being from 25c. to $1 a ton. Consumers in the district are operating at from 80 to 100 per cent of capacity, but they are fairly well supplied with materials and new business does not justify any additional commitments for material. New railroad lists include the following: Norfolk & Western, 11,000 tons; Wabash, 2600 tons; Northern Pacific, 2500 tons; Chicago & Alton, 2000 tons; Kansas City Southern, 350 tons; Texas & Pacific, 700 tons; Southern Railway, subsidiaries, 850 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$14.00 to $14.50
Rails for rolling	17.00 to 17.50
Steel rails less than 3 feet	18.00 to 18.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and under	32.50 to 33.50
Cast iron car wheels	16.50 to 17.00
Heavy melting steel	15.00 to 15.50
Heavy shoveling steel	15.00 to 15.50
Frogs, switches and guards cut apart	15.00 to 15.50
Railroad springs	18.00 to 18.50
Heavy axles and tire turnings	12.00 to 12.50
No. 1 locomotive tires	17.50 to 17.75
Per Net Ton	
Steel angle bars	15.00 to 15.25
Steel car axles	16.00 to 16.50
Iron car axles	24.25 to 24.50
Wrought iron bars and transoms	18.00 to 18.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.50 to 14.00
Cast iron borings	10.75 to 11.00
No. 1 busheling	12.50 to 13.00
No. 1 railroad cast	15.75 to 16.25
No. 1 machinery cast	18.00 to 18.50
Railroad malleable	13.25 to 13.50
Machine shop turnings	7.50 to 8.00
Champion bundled sheets	8.00 to 8.50

Cincinnati

Sales of Pig Iron Increased at Expense of Prices—Old Material Reduced

CINCINNATI, April 14.—Prices of pig iron have weakened during the past week in the Cincinnati market. The tonnage sold here has been larger than it has for many weeks, but practically every sizable sale was made at a concession from prevailing quotations. Dealers report that consumers are taking shipments on contract in a satisfactory manner. The biggest sale made locally during the past week was 1500 tons of Jackson County silvery to the Studebaker Corporation, Detroit, for delivery during June, July and August. It is reported that this sale was made at a price several dollars under the market. The Seybold Machine Co., Dayton, Ohio, purchased 1000 tons of resale Northern iron for less than $20, Ironton. The Hooven-Owens-Rentschler Co., Hamilton, Ohio, bought 500 tons of Northern iron. Other sales of Northern have been limited to lots of one or two cars. Inquiries include one from the Buick Motor Car Co., Flint, Mich., for 500 tons of 14 to 16 per cent electric furnace silvery iron for May delivery, and one from the Packard Motor Car Co., Detroit, for 500 tons of Northern silvery iron for shipment in June and July. Sales of Southern iron have been light and have been limited to small tonnages. Inquiries are also light. A Nashville, Tenn., consumer is inquiring for 100 tons for second quarter delivery, while a Cleveland, Tenn., consumer has an inquiry out for 100 tons for immediate delivery. Prices of Northern iron range from $21 to $22, Ironton, although there is shading of these figures on attractive tonnages. Tennessee iron continues to sell at $18.50, Birmingham. Alabama iron can be obtained for $20 to $22, Birmingham.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	$24.05 to $25.05
Alabama fdy., sil. 2.25 to 2.75	24.55 to 25.55
Tennessee fdy., sil. 1.75 to 2.25	22.55
Southern Ohio silvery, 8 per cent	32.77
Southern Ohio fdy., sil. 1.75 to 2.25	23.27 to 24.27
Southern Ohio, basic (nominal)	24.27
Southern Ohio malleable	24.27 to 25.27

Sheets.—Mills in this territory are operating on full time. The sheet mills of the American Rolling Mill Co. and of the Newport Rolling Mill Co. are running on a capacity schedule. Orders ahead have been coming in fairly well, but not so rapidly and in as great quantities as had been hoped for. Sales must show an increase to keep plants operating on their present basis. The local sheet market is still suffering from the effects of severe price competition. Black sheets are selling at 3.40c., Pittsburgh, although some sales have been reported at 3.50c. Reports have been heard of prices of 3.30c., but this does not represent the market. Prices on galvanized sheets range from 4.40c., Pittsburgh, to 4.60c., but the majority of sales are being made at the former figure. Blue annealed sheets have held fairly steady at 2.60c., but auto sheets are being offered at 4.40c. Jobbers have only a small stock on hand and, therefore, are demanding speedy delivery in many cases when they place orders with mills. Sales executives feel that the volume of sheets sold during April will represent a small increase over March. Buying, however, is being done in small quantities and jobbers are not inclined to anticipate requirements except for the immediate future.

Tin Plate.—Most of the can manufacturers have filed their specifications for the first half of the year, but there still remain a few who have not sent in their requirements through June. The volume of business is holding up to a satisfactory level and mill production is heavy. The price continues firm at $5.50 per base box, Pittsburgh.

Wire Goods.—No improvement has been noted in the nail market. Renewal of contracts for second quarter business at 2.75c., Pittsburgh, has established that price as the prevailing quotation locally. The former price of 2.85c. apparently has disappeared, at least for the present. Buying is being done in small

lots and dealers are displaying much independence. They are, in many instances, giving their business to the lowest bidder. The market for plain wire is weak, with 2.60c., Pittsburgh, as the price, although some mills are quoting at a lower figure in order to secure orders. No improvement in either nails or wire is looked for in the next few weeks.

Plates, Shapes and Bars.—The market has been rather quiet during the past week. Sales have been limited to small tonnages. The Cleveland, Cincinnati, Chicago & St. Louis Railroad Co. is reported to be in the market for a considerable tonnage of plates and shapes. Sellers feel that sales will continue at about the present level in the immediate future. Specifications against contracts are fair. The price of 2.10c., Pittsburgh, continues to be the prevailing quotation, although prices under this figure have been reported.

Structural Steel.—Business has been quiet in this territory. No awards of large size have been reported, although there has been a fair volume of jobs let of small tonnages. Pending projects are more numerous than a week ago. Bids are now in on the First National Bank Building, Tampa, Fla., about 650 tons. No award has been announced on the bridge across the Ohio River at Huntington, W. Va., although the Mt. Vernon Bridge Co. is reported to be the low bidder. Prices are still holding at 2.10c., Pittsburgh.

Reinforcing Bars.—Awards were more numerous the past week than they have been for a considerable time. The Pollak Steel Co. and the Bourne-Fuller Co. each secured 250 tons for the new building of the J. Charles McCullough Seed Co., Cincinnati. These two companies also supplied 200 tons each for the Phelps Apartments, Cincinnati. The Children's Hospital, Cincinnati, 300 tons, was awarded to the Pollak Steel Co. Pending business runs into good tonnage. The Booth Memorial Hospital, Covington, Ky., will require about 200 tons. Samuel Hannaford & Sons, Cincinnati architects, will take bids on this job until April 17. The Kroger Grocery & Baking Co., Cincinnati, is planning a new warehouse which will take about 385 tons. C. F. Stegner, Cincinnati, is the architect. Another pending project is the hotel on Garfield Place, Cincinnati, for which Elzner & Anderson, Cincinnati, are the architects. This will require 125 tons. There has been no variation from the quotation of 2.10c., mill, on new billets. Rail steel is selling at 1.95c., mill, and is showing signs of weakness.

Warehouse Business.—Sales have been taking an upward trend and dealers are encouraged by the increase in the volume of their business. Conditions are still rather spotty. Some of the dealers report that their sales are about on a par with the volume attained last month. Indications at present point to the volume of sales for April going ahead of the business done in March. There has been an increase in the number of orders placed with dealers and the tonnage is holding up well. Structural steel and bars are in much better demand. Buyers are still cautious in making purchases and are coming into the market principally to fill their immediate requirements. Prices remain steady at the following figures:

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $2.25 per 100 lb.; common wire nails, $3.25 per keg base; cement coated nails, $2.65 per keg; chain, $7.55 per 100 lb. base; large round head rivets, $3.75 base; small rivets, 65 per cent off list. Boiler tubes, prices net per 100 ft., lap welded steel tubes, 2-in., $18; 4-in., $38; seamless, 2-in., $19; 4-in., $39.

Coke.—The coke market is rather slow. Specifications are not as satisfactory this month as last. Domestic business has fallen off to a considerable extent. Prices continue to hold firm at the figures quoted a week ago.

Connellsville furnace, $3.25 to $3.75; foundry, $4.25 to $5.00; New River foundry, $8.00 to $8.50; Wise County furnace, $4.00 to $4.75; foundry, $4.50 to $6.00; by-product foundry, $6.50 Connellsville basis.

Old Material.—The scrap market is in a demoralized condition. Mills are not buying anything and railroads are offering large tonnages. Dealers have considerable material on hand and are not inclined to buy unless they can do so at particularly attractive prices. The Southern, Louisville & Nashville, Chesapeake & Ohio and Norfolk & Western have large lists closing this week. Prices on most items have decreased 50c. a ton.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$13.50 to $14.00
Scrap rails for melting	13.50 to 14.00
Short rails	17.50 to 18.00
Relaying rails	28.00 to 28.50
Rails for rolling	15.00 to 15.50
Old car wheels	13.50 to 14.00
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	16.00 to 16.50
Agricultural malleable	14.50 to 15.00
Loose sheet clippings	9.50 to 10.00
Champion bundled sheets	12.00 to 12.50
Per Net Ton	
Cast iron borings	8.50 to 9.00
Machine shop turnings	7.50 to 8.00
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	15.00 to 15.50
Iron axles	22.00 to 22.50
No. 1 railroad wrought	11.00 to 11.50
Pipes and flues	7.50 to 8.50
No. 1 busheling	9.50 to 10.00
Mixed busheling	8.50 to 9.00
Burnt cast	9.50 to 10.00
Stove plate	10.00 to 10.50
Brake shoes	11.00 to 11.50

Boston

Indications Are Third Quarter Pig Iron Buying Will Start Shortly

BOSTON, April 14.—Current transactions in pig iron are small. Three melters having out inquiries on a total of about 2000 tons have postponed buying. In a few instances, however, melters are feeling out the market with a view to buying third quarter iron. Sellers are certain a buying movement will start as soon as foundries are convinced prices have reached bottom. When that time will be is, of course, problematical. Buffalo No. 2X iron, in round tonnages, is available at $20 furnace. No. 2 plain is quoted at $20 furnace also. Eastern Pennsylvania, Virginia and Alabama furnaces apparently are standing pat, and now that importers have been obliged to put iron into storage there is less inclination to slash prices, especially as there is no great quantity for sale. An additional 1192 tons of Indian iron has been landed here, bringing importations of such iron for the month up to 2729 tons and for the year up to 19,296 tons.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$25.65 to $26.15
East. Penn., sil. 2.25 to 2.75	26.15 to 26.65
Buffalo, sil. 1.75 to 2.25	24.91 to 25.41
Buffalo, sil. 2.25 to 2.75	24.91 to 25.91
Virginia, sil. 1.75 to 2.25	29.42 to 29.92
Virginia, sil. 2.25 to 2.75	29.92 to 30.42
Alabama, sil. 1.75 to 2.25	31.60
Alabama, sil. 2.25 to 2.75	32.10

Cast Iron Pipe.—Domestic pipe continues to meet stiff competition from French. As stated in THE IRON AGE last week in the New York report, the three domestic manufacturers submitting bids on 1200 tons 48-in. required by Boston were underbid by the B. Nicoll Co., representing French pipe makers. The contract, however, was awarded the Warren Foundry & Pipe Co., making the second time Boston has turned down French pipe. All bids on a round tonnage of pipe required by Fall River, Mass., were rejected. Prices quoted openly by domestic pipe manufacturers follow: 4-in., $62.10 a ton delivered common Boston rate points; 6-in. to 12-in., $57.10; 16-in. and larger, $56.10. The usual differentials of $5 on Class A and gas pipe are quoted.

Coke.—The status of the by-product foundry coke market is unchanged. Both the New England Coal & Coke Co. and the Providence Gas Co. quote such fuel at $11.50 a ton delivered in New England; both report specifications against first half contracts as running approximately 25 per cent behind a year ago. Any im-

provement in the demand for coke from jobbing foundries is offset by the comparatively small consumption by large plants. The presumption is that both New England coke companies will open books for last half contracts within a fortnight, but no official announcement has been made by either company.

Old Material.—A further downward adjustment in prices comes as a result of continued inactivity. Holders of material, heretofore reluctant to sell because of prevailing prices, are even more so. Brokers are now holding back because material taken early in the week drops in price to below the purchased basis, thereby eliminating profit. Chemical borings were taken the past week in a small way at $12.50 on cars, while the market today is nearer $11.50. For machine shop turnings $7.75 was paid, although most offers do not exceed $7.50. Heavy melting steel sold as low as $10, that price being considerably under most offers. A sale of stove plate at $10 on cars for shipment outside New England also is reported. Small lots of textile machinery cast brought $19.50 delivered and regular No. 1 machinery $18.50.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$18.50 to $19.50
No. 2 machinery cast	16.50 to 17.50
Stove plates	13.00 to 13.50
Railroad malleable	19.00 to 20.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.50 to $11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	12.00 to 12.50
Wrought pipe (1-in. in diam., over 2 ft. long)	10.50 to 11.00
Machine shop turnings	7.25 to 7.75
Castiron borings, chemical	11.50 to 12.00
Cast iron borings, rolling mill	8.50 to 9.00
Blast furnace borings and turnings	7.00 to 7.50
Forge scrap	8.50 to 9.00
Bundled skeleton	8.50 to 9.00
Bundled cotton ties	8.50 to 9.00
Forged flashings	8.50 to 9.00
Shafting	17.00 to 17.50
Street car axles	17.00 to 17.50
Rails for rerolling	11.50 to 12.50
Scrap rails	10.50 to 11.50

San Francisco

Prices Generally Weak—New Business Small—Conditions Quiet

SAN FRANCISCO, April 11 (*By Air Mail*).—Second quarter business is opening quietly, with price softness as the most pronounced feature. New business is light, and general indications tend toward strengthening the belief of many that the present situation is definitely developing into a buyers' market. There is, however, a consistent amount of small business, which, in aggregate tonnage, is fairly substantial. The Southern Pacific Co. for 835,000 tie plates, about 5100 tons, 3080 kegs of track bolts, 10,000 kegs of spikes and 190 tons of plates.

Fresh inquiries during the past week, for both shapes and plates, amounted to 1565 tons. Awards totaled 2123 tons. Bar awards totaled 2270 tons, and lettings in cast iron pipe called for 1615 tons.

Pig Iron.—A shipment of 2000 tons of English foundry iron arrived at this port during the past week. Most of it had already been sold, some in this district and some in the Pacific Northwest, the price here being $27, duty paid, f.o.b. cars. Small sales of Dutch iron have been made recently at $25.50. Small but consistent sales of Utah iron continue both here and in Los Angeles. Generally, however, the pig iron market is quiet. Prices are holding fairly firm, although frequent rumors of price shading are heard.

*Utah basic	$27.25 to $28.25
*Utah foundry, sil. 1.75 to 2.25	27.50 to 28.50
**Scotch foundry	28.00 to 30.00
**English foundry	27.00 to 28.00
**Belgian foundry	26.00 to 27.00
**Dutch foundry	25.25 to 26.50
**Indian foundry	26.00 to 27.00
*Birmingham, Ala., foundry, sil. 2.75 to 3.25	31.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—The Emsco Steel Products Co., Los Angeles, has placed 1000 tons for stock with an Eastern mill. Fresh inquiries totaled 1065 tons. The Mossdale Bridge, Stockton, 400 tons, was taken by Minneapolis Steel & Machinery Co. McClintic-Marshall Co. took 200 tons for the Celite Products Co. plant at Lompoc, and Central Iron Works was awarded 200 tons for an apartment house on Post near Leavenworth Street, San Francisco. Quotations are 2.50c. to 2.55c., c.i.f. Large foreign material is quoted at 2.20c., duty paid, c.i.f.

Plates.—About 1325 tons were awarded during the week. The Western Pipe & Steel Co. took about 983 tons for the Vista Irrigation District pipe line in San Diego County, and the Steel Tank & Pipe Co. took 340 tons for bins for Hills Bros., San Francisco. Bids will be closed April 22 for 167,000 ft. of 4-in. to 18-in. pipe for the Vista Irrigation District. Specifications call for between 300 and 500 tons of plates. Prices are holding at about 2.50c., c.i.f., although 2.45c. is the going price on desirable tonnages.

Bars.—The Pacific Coast Steel Co. was awarded the contract for 2000 tons of reinforcing bars for the Bremmerton Navy Yard, Bremmerton, Wash. Edw. L. Soule Co. took 270 tons for the La Conte School, San Francisco. Bar awards of the past week included the following:

Eureka School, Eureka, Cal., 250 tons, to United States Steel Products Co.
Guernsey Dam, Mitchell, Neb., 700 tons, Utah Construction Co. general contractor, bars placed with unannounced firm.
Phoebe Hearst Memorial Gymnasium, University of California, Berkeley, about 500 tons, to Edw. L. Soule Co.
Bulletin Building, Tenth and Mission Streets, San Francisco, 160 tons, to Edw. L. Soule Co.
Wilson Theater, Fresno, Cal., 350 tons, to Kyle & Co.

Warehouse Business.—There is a fair volume of small orders being filled daily. Jobbers' sales totals for March exceeded expectations. April has opened fairly well and according to jobbers' estimates compares favorably with the average for the first ten days of last month.

Merchant bars, $3.30 base, per 100 lb.; merchant bars, ⅝ in. and under, rounds, squares and flats, $3.80 base, per 100 lb.; soft steel bands, $4.15 base, per 100 lb.; angles, 3/16 in. and larger x 1½ in. to 2¾ in., inc., $3.30 base, per 100 lb.; channels and tees, ¾ in. to 2¾ in., inc., $3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, $3.15 base, per 100 lb.; tees, 3 in. and larger, $3.30 base, per 100 lb.; universal mill plates, ¼ in. and heavier, stock lengths, $3.30 base, per 100 lb.; spring steel, ¼ in. and thicker, $6.30 base, per 100 lb.; wire nails, $4 base, per 100 lb.

Cast Iron Pipe.—About 881 tons was awarded. Prices are unchanged, $53 to $54 base, delivered, being quoted in this district. Recent lettings include the following:

San Bernardino, Cal., 6 in. and 8 in., Class C, 630 tons, to United States Cast Iron Pipe & Foundry Co.
San Bernardino, Cal., 4 in., Class C, 131 tons, to American Cast Iron Pipe Co
Los Angeles, 2 in. cast iron pipe, 800 tons, to McWane Cast Iron Pipe Co.

Steel Pipe.—Contracts calling for 800 tons of 8-in. and 16-in. welded steel pipe, and 1589 tons of 4-in. and 6-in. standard screw pipe have been awarded the Crane Co. by the city of Los Angeles.

Track Supplies.—Bids have been called for by the Southern Pacific Co. for 1000 kegs of track bolts and 100 tons of blooms, April 15, and 150 kegs of track bolts, April 23. Bids closed April 10 for 5100 tons of tie plates, 4000 kegs of track bolts and 18,800 kegs of spikes.

Cast Iron Pipe.—Business is quiet, prices remain at $53 to $54 base, delivered, San Francisco district, and only two awards were made during the week, amounting to 1615 tons. Los Angeles awarded 1330 tons of 12-in. pipe to the American Cast Iron Pipe Co. and 285 tons of 8-in. pipe to the National Cast Iron Pipe Co.

Coke.—A local importer received 5000 tons of English foundry coke during the past week. Prices are unchanged and the demand is slightly stronger, although there is no large buying.

English beehive, $16 to $18 at incoming dock, and English by-product, $14 to $15; Birmingham, Ala., by-product, $19.50 to $20.50 delivered; Wise County, Va., beehive, $22 delivered.

Old Material.—Small sales of heavy melting steel are being made at $11 per gross ton. General interest is apathetic. Prices in Los Angeles are about $1 a ton below San Francisco quotations.

Cleveland

Pig Iron Affected by Ore Reduction—Weakness in Steel Bars

CLEVELAND, April 14.—Business in finished steel is not holding up to the March volume. Specifications for large tonnages are coming from the automobile manufacturers against recent contracts and there is some new demand for steel bars that is coming directly or indirectly from the same source. However, Detroit automobile companies are not buying beyond 60 days' requirements, as they are uncertain whether car sales will hold up in the early summer. Business from other sources is light. The market lacks strength on many items. During the week this was particularly true of steel bars, which are now being quoted at 2c., Pittsburgh, by some of the mills, except for small lots, while others are still holding to 2.10c. Plates range from 2c. to 2.10c., and while the lower price has become more common, car lot sales are still being taken at 2.10c. Structural material is firmer than bars and plates. The common price is 2.10c., but it is claimed that a round lot inquiry would bring out a 2c. quotation. The Brown Hoisting Machinery Co. has taken three large coal handling bridges for the Consolidated Gas Co., New York, requiring 3000 tons of structural steel, plates and bars, not yet placed. The Mt. Vernon Bridge Co. has been awarded the Ohio bridge at Huntington, W. Va., requiring 3500 tons, for which it was previously reported to be the low bidder. The War Department has an inquiry out for a dredge requiring 1000 tons of plates and structural shapes, on which Lake yards are figuring. Three Lake boats are pending, two for the Pittsburgh Steamship Co. and one for an interest affiliated with the Inland Steel Co. The Biggs Boiler Co., Akron, has taken the Minneapolis riveted steel pipe line requiring 800 tons of plates, which will be furnished by a Pittsburgh district mill. Cleveland has an inquiry out for 8000 ft. of 32-in. steel pipe. In the building field very little structural inquiry is coming out in this territory.

Pig Iron.—The cut in ore prices has had a depressing effect on pig iron and some furnaces have reduced prices 50c. to $1 a ton. There is very little activity, which seems due to the fact that buyers are marking time, believing prices may go lower and because few foundries need iron. It is becoming apparent that the overbuying late last year for the first quarter of this year was heavier than has been estimated and many foundries will have enough iron to last them well into May or longer. Those that need iron are buying in small lots as required. A more favorable aspect of the situation is in the increased melt by the automotive industry. It is estimated that several foundries in this field will have to purchase 35,000 tons of iron to carry them through the second quarter. One inquiry for 4000 tons is now pending from this source. One producer has received two inquiries aggregating 1000 tons of foundry iron for the second half. However, no inquiries have come out for the third quarter. The Lake furnace price on foundry and malleable iron has settled down to $21, although for Michigan and other delivery points where Valley furnaces do not compete the price is $21.50. The Cleveland market is without tested prices and local furnaces are nominally asking $22.50 at furnace for local delivery, but Cleveland consumers can buy iron on the Valley basis of $21.50, bringing the delivered price in Cleveland 75c. a ton below the local asking price. In the Valley district quotations of $20 are reported, although $20.50 is the common price. Bessemer iron is down 50c. to $21.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$20.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	$22.25 to 23.00
Southern fdy., sil. 1.75 to 2.25	25.01 to 26.01
Malleable	22.25 to 23.00
Ohio silvery, 8 per cent	32.52 to 33.52
Standard low phos., Valley furnace	28.50

Iron Ore.—The market has not shown much life since the new prices were named, although one leading interest reports several open market sales. It is not expected that there will be much activity within the next few weeks. Some of the ore firms are starting the season with a better backlog in the form of long term contracts than ever before. In addition to the adoption of an uniform base, the ore price structure has been further simplified by changing the method of computing the unit value, as explained elsewhere. In making the 50c. price cut, the company that named the price evidently took into consideration among other things the fact that some ore was sold last year at 50c. a ton under the market price. The same interest that set last year's prices named the 1925 prices and expected that the 80c. cut last year was enough to put an end to the price shading by some of the smaller producers but this expectation was not realized. With the additional 50c. cut it seems improbable that the regular ore prices will be shaded this season. It has developed that the ore bought by the Ford Motor Co. was divided among three leading ore firms, only one of which got any of the Ford business last year. The Ford inquiry was for 160,000 tons but the purchase was for a slightly larger tonnage. Vessel contracts for considerable ore have been placed in the last two or three days at 70c. a ton from the head of Lake Superior or the same rate that prevailed last year and the season's rates are regarded as virtually established on that basis. A reduction in ore rates this season had not been expected and consequently the possibility of lower rates was not a factor in the decision to cut ore prices. The vessel rate on ore is 63c. from Marquette and 52c. from Escanaba to Lake Erie ports and 42c. from Escanaba to Chicago. The season of navigation will open the latter part of this week with shipments from Escanaba but the general start is not expected before about May 1.

Semi-Finished Steel.—With most consumers carrying over steel from the first quarter, there is virtually no new demand for semi-finished steel, but some of the mills will need additional sheet bars for May. The $50 price on wire rods has disappeared. Buyers generally were covered at $48 for the second quarter before the last advance, which never became effective.

Sheets.—Mills having contracts with the Detroit automobile companies are getting heavy specifications, but new business is light. The market is weak and price cutting is not bringing out much business. Black sheets are now rather commonly quoted at 3.35c. and in Detroit a 3.30c. price is reported. Blue annealed sheets are firm at 2.60c. Galvanized sheets are holding rather steady to 4.50c., although there are reports of a 4.40c. price. Some of the mills are making price concessions to move their stocks and are offering prime sheets at 3.25c. for black and 4.25c. for galvanized.

Hot-Rolled Flats.—Some of the hot-rolled strip mills are in better shape than a few weeks ago, owing to orders from the automotive industry, and prices are fairly firm. Mills are holding to 2.40c. for wide strip, hoops and bands and to 2.20c. for narrow strip.

Bolts, Nuts and Rivets.—Orders for bolts and nuts are still coming out in good volume and prices are firm. The demand for rivets is rather light and shading of $1 to $2 a ton is reported on large rivets.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 3.85c.; No. 9 annealed wire, $3.05 per 100 lb.; No. 9 galvanized wire, $3.50 per 100 lb.; common wire nails, $3.15 base per 100 lb.

Coke.—Sales of foundry coke are limited to small lots. Prices are unchanged at $4.25 to $5.50 for the better grades of standard Connellsville foundry coke.

Old Material.—The scrap market continues weak and inactive. Prices have declined 25c. a ton on borings and bushelings and 75c. a ton on turnings. Small lot sales of heavy melting steel to dealers are reported at $16.25. A Valley district consumer has purchased a round tonnage of compressed steel scrap at a reported price of $16 and dealers are offering $15.50 for this

grade to cover against their orders. Local mills are taking shipments on contracts better than they have been for some time.

We quote dealers' price f.o.b. Cleveland per gross ton:

Heavy melting steel	$16.25 to $16.50
Rails for rolling	16.50 to 16.75
Rails under 3 ft.	18.75 to 19.00
Low phosphorus melting	19.00 to 19.50
Cast iron borings	12.75 to 13.00
Machine shop turnings	12.25 to 12.75
Mixed borings and short turnings	12.75 to 13.00
Compressed sheet steel	13.50 to 14.00
Railroad wrought	12.25 to 12.75
Railroad malleable	19.00 to 19.50
Light bundled sheet stampings	11.50 to 12.00
Steel axle turnings	14.50 to 14.75
No. 1 cast	18.25 to 18.75
No. 1 busheling	12.50 to 13.00
Drop forge flashings	12.25 to 12.50
Railroad grate bars	14.00 to 14.25
Stove plate	14.00 to 14.25
Pipes and flues	8.50 to 9.00

Philadelphia

Iron and Steel Market Continues Weak and Business Is No Better

PHILADELPHIA, April 14.—While some steel company sales offices are able to report that specifications are at least as good as during the first half of March, this is not true of plates and Eastern plate mills are operating at a low rate. The plate price, however, continues at 2c., Pittsburgh, for this immediate district. Structural shapes are in fair demand, but the continued need of some of the smaller mills for orders is a weak influence in the market and current quotations on the larger lots are frequently off $1 or $2 a ton from the so-called "regular" price. The extension of first quarter steel bar contracts by some mills has given buyers a chance to obtain bars at 2c., Pittsburgh, and specifications have been fairly good. Sheets are weak and prices uncertain. Ofttimes the prices mentioned are those which certain buyers "think" they could buy at and are lower than those given by most sellers as their minimum.

A sluggish pig iron market has been somewhat enlivened the last day or two by a fairly good inquiry. Prices seem to show a little more resistance. Scrap continues weak. A large tonnage of heavy melting steel went last week at $15, delivered.

Ferroalloys.—Both domestic producers and importers of ferromanganese maintain quotations on ferromanganese at $115, furnace or seaboard, despite the scarcity of business.

Pig Iron.—The views of sellers are slightly more hopeful, due principally to an anticipated decline in production. The Witherbee, Sherman & Co. furnace at Port Henry, N. Y., was banked today (Tuesday) and will probably be blown out if business has not materially improved in a few weeks. Other furnaces are due to go out soon and only one is scheduled to come in, that being the Delaware River Steel Co.'s stack at Chester, Pa. The $22 base on foundry iron has now been in effect for about two weeks without any definite signs of a further decline. In the past day or two, inquiry has considerably increased and sellers take the view that some buyers are awaking to the fact that prices are scraping bottom, and that if they should go lower, it will not be for long. Most foundries are still getting iron on their first quarter contracts, but it is believed that some of them will have to buy for May shipment and many of them will need iron before the middle of the second quarter. Eastern Pennsylvania furnaces have been almost crowded out of New England by the low prices quoted on foreign iron, but foreign iron is becoming less of a factor in and around Philadelphia. Low prices on Buffalo iron have also taken business in northern New Jersey and northern Pennsylvania which ordinarily comes to eastern Pennsylvania furnaces. A western Pennsylvania furnace, with a base price of $20 on foundry grades, is reaching certain points in central Pennsylvania at lower delivered prices than eastern Pennsylvania furnaces will quote.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rate varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$22.76 to $23.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	23.26 to 24.63
East. Pa. No. 1X	24.26 to 25.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 29.67
Virginia No. 2X, 2.25 to 2.75 sil.	29.67 to 30.17
Basic delivered eastern Pa.	22.75 to 23.25
Gray forge	23.00 to 23.50
Malleable	24.00 to 24.50
Standard low phos. (f.o.b. furnace)	25.00 to 26.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00

Various grades of foreign pig iron are being offered at approximately the prices quoted below, all quotations being f.o.b. cars, Philadelphia:

Indian foundry iron, 2 to 2.50 per cent sil.	$23.50 to $24.00
Indian foundry iron, 2.25 to 3 per cent sil.	24.00 to 24.50
English foundry iron, 2 to 2.50 per cent sil.	23.00 to 23.50
Continental foundry, 2.50 to 3 per cent sil.	23.00 to 23.50
English low phos., copper free	26.00

Billets.—Eastern mills are getting very little inquiry for billets. Prices remain nominally at $37 to $37.50, Pittsburgh, for rerolling quality, with $5 higher for forging quality.

Plates.—Small orders for plates are the rule and the aggregate tonnage is not enough to give Eastern plate mills as good an operation as they have had in the past month or so. One of the leading producers is piling cold ingots and will probably put out another open-hearth furnace soon. Buyers have made efforts to obtain quotations lower than 2c., Pittsburgh, but apparently without success so far as this immediate district is concerned. The Baldwin Locomotive Works will build 20 locomotives for the Seaboard Air Line.

Structural Shapes.—A fair amount of inquiry for fabricated material is in the market and if half of it should result in contracts business would be good. There is a good deal of hesitating, however, and meanwhile the volume of contract specifications and new business is no better than a month ago, if as good. While some mills continue to name 2.10c., Pittsburgh basis, others quote 2c., and the latter price is not taking much desirable business. Some mills have on occasion gone to 1.95c., Pittsburgh, or less.

Bars.—Specifications for steel bars have been better with those mills which have extended first quarter contracts at 2c. into second quarter. On new business 2.10c. is quoted by all makers, but not much is being taken at this figure. Bar iron is dull and unchanged in price, 2.28c., Philadelphia, being quoted.

Sheets.—Possibly the sheet situation is being represented as worse than it really is, but prices are very irregular. On black sheets 3.40c. is apparently now the top of the market, but just how much lower has been done in this district is uncertain. Galvanized sheets are mentioned as being 4.50c. to 4.60c., but are not strong at those figures. Blue annealed sheets are quoted at 2.60c., with intimations that some mills have quoted less.

Warehouse Business.—No further changes in warehouse prices have been made in the past week, local distributers now quoting as follows for local delivery:

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 3.10c.; tank steel plates, ⅛ in., 3.25c.; blue annealed steel sheets, No. 10 gage, 3.70c.; black sheets, No. 28 gage, 4.70c.; galvanized sheets, No. 28 gage, 5.85c.; square, twisted and deformed steel bars, 2.85c.; structural shapes, 3.10c.; diamond pattern plates, ¼-in., 5.30c.; ⅛-in., 5.50c.; spring steel, 5c.; round cold-rolled steel, 4.15c.; squares and hexagons, cold-rolled steel, 4.65c.; steel hoops, 4.20c. base; steel bands, No. 12 gage to ⅛ in., inclusive, 3.95c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 7c.

Imports.—Germany continues to send large amounts of pig iron, 3250 tons having come in at Philadelphia last week from that country, and 50 tons came from Holland. Other imports were: Steel bars from Bel-

gium, 332 tons; bar iron from France, 38 tons; iron ore from Algeria, 6850 tons, and chrome ore from Portuguese Africa, 5532 tons.

Old Material.—An Eastern steel company last week bought a substantial tonnage of heavy melting steel at $15, delivered. The business was divided between two brokers, whose best offers are $14.50, delivered to the mill. Several other grades have also declined in price.

We quote for delivery consuming points in this district as follows:

No. 1 heavy melting steel	$14.50 to $15.50
Scrap rails	14.50 to 15.50
Steel rails for rolling	18.00 to 19.00
No. 1 low phos. heavy 0.04 and under	20.00 to 21.00
Couplers and knuckles	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Cast-iron car wheels	18.00 to 18.50
No. 1 railroad wrought	18.00 to 18.50
No. 1 yard wrought	17.00 to 17.50
No. 1 forge fire	14.00 to 14.50
Bundled sheets (for steel works)	13.00
Mixed borings and turnings (for blast furnace use)	11.50 to 12.00
Machine shop turnings (for steel works use)	12.50
Machine shop turnings (for rolling mill use)	13.00
Heavy axle turnings (or equivalent)	14.50 to 15.50
Cast borings (for steel works and rolling mill)	13.00 to 13.50
Cast borings (for chemical plants)	17.00 to 18.00
No. 1 cast	17.50 to 18.00
Heavy breakable cast (for steel plants)	15.00 to 16.00
Railroad grate bars	13.00
Stove plate (for steel plant use)	13.00
Wrought iron and soft steel pipes and tubes (new specifications)	15.00 to 15.50
Shafting	21.00 to 22.00
Steel axles	22.00 to 23.00
*Utah basic	$27.25 to $28.25
*Utah foundry, sil. 1.75 to 2.25	27.50 to 28.50
**Scotch foundry	28.00 to 30.00
**English foundry	27.00 to 28.00
**Belgian foundry	26.00 to 27.00
**Dutch foundry	25.25 to 26.50
**Indian foundry	26.00 to 27.00
*Birmingham, Ala., foundry, sil. 2.75 to 3.25	31.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

English beehive, $16 to $18 at incoming dock, and English by-product, $14 to $15; Birmingham, Ala., by-product, $19.50 to $20.50 delivered; Wise County, Va., beehive, $22 delivered.

RAILROAD EQUIPMENT

Good Car Inquiries and Orders for 69 Locomotives

Southern railroads are conspicuous in the week's business in the equipment field. The Seaboard bought 40 locomotives, the Florida East Coast 21 locomotives and the Atlantic Coast Line 700 cars. Some 800 cars in all were purchased and inquiries for 8300 appeared, including prospects of 1800 for the Wabash. The chief items are given below.

The Department of Commerce announces that March shipments of railroad locomotives from the principal manufacturing plants totaled 109 locomotives, as compared with 85 in February and 132 in March, 1924.

The Seaboard Air Line has ordered 20 Mikado type locomotives from the American Locomotive Co. and 20 from the Baldwin Locomotive Works.

The Florida East Coast Railroad, which recently inquired for 21 locomotives, has ordered these from the American Locomotive Co., there being 15 Mikado type and 6 8-wheel switchers.

The Detroit & Toledo Shore Line Railroad has ordered 2 8-wheel switching engines and 1 Mikado type locomotive from the American Locomotive Co.

The Reading has ordered 5 switching locomotives from the Baldwin Locomotive Works.

The Fruit Growers Express is in the market for 1200 steel underframes for freight cars.

The Pittsburgh Coal Co. is inquiring for 700 mine cars.

The Pennsylvania Railroad is expected to issue an inquiry shortly for 200 or 300 passenger coaches.

The Chicago, Rock Island & Pacific has ordered 100 50-ton gondolas from the American Car & Foundry Co.

The Baltimore & Ohio has ordered 20 additional all-steel passenger coaches from the Standard Steel Car Co.

The Standard Tank Car Co. has received the following orders: 2 insulated 8050-gal. cars from the Homer F. Wilcox Co., Tulsa, Okla.; 2 triple compartment cars from the Canfield Oil Co., Cleveland, and 10 10,050-gal. cars from the Hercules Gasoline Co., Los Angeles.

The receivers of the Chicago, Milwaukee & St. Paul have issued inquiries for 3000 box, 1500 stock and 1000 automobile cars.

The Missouri-Kansas-Texas, which recently withdrew an inquiry for 300 gondola cars, has entered the market for 300 composite 50-ton center dumping hopper cars.

The Wabash is reported to be contemplating an inquiry for 1800 cars.

The Atlantic Coast Line has placed 500 box and 200 phosphate cars with the Tennessee Coal, Iron & Railroad Co.

The Soo Line has ordered 42 underframes for caboose cars from the Siems-Stembel Co.

The Chesapeake & Ohio has revived an old inquiry for locomotives.

The Minneapolis & St. Louis is inquiring for 20 Mikado type engines.

The New York Central has entered the market for 2 more passenger and baggage cars and 10 baggage and mail cars.

The Richmond, Fredericksburg & Potomac is inquiring for 4 express and 1 postal car.

The Soo Line will build 10 milk cars in its Shoreham, Minn., shops.

INSTITUTE ORGANIZED

Manufacturers and Users of Refractories Unite to Improve the Industry

PITTSBURGH, April 14.—The organization of the American Refractories Institute was completed at a meeting held at the Mellon Institute of Industrial Research, University of Pittsburgh, here today, with the election of a board of directors. A meeting for the election of officers for the new organization will be held April 29. Directors elected to serve one year are Frank R. Valentine, George H. Diack, Porter S. Kier, E. F. Myers, R. A. B. Walsh, F. J. Helwig and W. L. Stapler; for two years, J. M. McKinley, C. C. Edmunds, Charles E. Kapitzky, E. M. Weinfurtner, Charles S. Reed, J. L. Green and J. T. Roberts; for three years, George A. Balz, J. D. Ramsey, J. E. Lewis, Burrows Sloan, A. P. Taylor, A. P. Green and H. L. Tredenrick. Porter S. Kier was temporary chairman and M. C. Booze acted as temporary secretary of the meeting. Following the election of the directors the program of addresses as outlined in THE IRON AGE of April 9, page 1093, was carried out, and there was inspection of the laboratories of Mellon Institute, which was followed by luncheon at the University Club.

Mr. Ramsey's Address

The initial address of the meeting was given by J. D. Ramsey, who outlined the aims and objects of the institute. He pointed out to the prospective membership, which is composed of manufacturers of refractories as active members and users of refractories as associates, the many advantages of cooperation along the lines of betterments in practices and materials to be secured by joint action of the two classes of membership. He also called attention to the possibilities outlined in the papers of this, the initial meeting, in which was detailed the year's work of scientific concentration on the question of materials and the thermal conductivity of refractories, the definite plotting of curves showing heat absorption and radiation on the one hand and the tendency of present day silica and clay brick to spall in furnace walls and other places where the heating and cooling were not uniform over the whole area of a brick or wall, causing uneven expansion and contraction, thereby starting the spall at the points of uneven temperature. Only by the cooperation of manufacturers and consumers of refractories, Mr. Ramsey said, can the bad practices be eliminated and better quality and service be obtained. With this as the keynote of the new organization, he predicted a better understanding between those who made and used refractories. Among the early possibilities of the new institute is the organization of an exclusive laboratory or the tieing up of such a department, including a department of ceramics, with one of the big universities.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....2c. to 2.10c.
F.o.b. Chicago, base, per lb.....2.30c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....2.10c.
F.o.b. Chicago, base, per lb.....2.30c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....2.10c.
Soft steel bars f.o.b. Chicago, base, per lb.....2.20c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb....2.10c.
Rail steel bars, f.o.b. Chicago district mills, base, per lb.2.10c.
Common iron bars, f.o.b. Chicago, base, per lb.....2.10c.
Refined iron bars, f.o.b. P'gh mills, base, per lb..3c. to 3.10c.
Common iron bars, eastern Pa. mill, base, per lb.....2.10c.

Hot-Rolled Flats

Hoops, base, per lb., Pittsburgh.....2.40c.
Bands, base, per lb., Pittsburgh.....2.40c.
Strips, 6 in. and narrower, base, per lb., Pittsburgh....2.40c.
Strips, wider than 6 in., base, per lb., Pittsburgh.....2.20c.
Strips, base, per lb., Chicago.....2.55c. to 2.60c.

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb. 2.70c. to 2.80c.
Screw stock and shafting, f.o.b. Chicago, base, per lb., 2.70c. to 2.80c.
Screw stock, base, per lb., Cleveland.....2.75c. to 2.80c.
Shafting, ground, f.o.b. mill, base, per lb.....3.20c.
Strips, f.o.b. P'gh mills, base, per lb.....4c.
Strips, f.o.b. Cleveland mills, base, per lb.....4c.
Strips, f.o.b. Chicago, base, per lb.....4.30c. to 4.34c.
Strips, f.o.b. Worcester mills, base, per lb.....4.15c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg $2.85
Galvanized nails, 1-in. and longer, base plus..... 2.25
Galvanized nails, shorter than 1 in., base plus..... 2.50
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.60
Annealed fence wire, base, per 100 lb..... 2.75
Spring wire, base, per 100 lb..... 3.60
Galvanized wire, No. 9, base, per 100 lb..... 3.20
Galvanized barbed, base, per 100 lb..... 3.55
Galvanized staples, base, per keg..... 3.55
Painted barbed wire, base, per 100 lb..... 3.30
Polished staples, base, per keg..... 3.30
Cement coated nails, base, per count keg..... 2.15
•Bale ties, carloads, to jobbers....75, 15 and 5 per cent off list
•Bale ties, carloads to retailers...75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers.....$67.00

Chicago district mill prices are $2 per ton above the foregoing and Chicago delivered prices are $3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant, and Duluth, Minn., mills $2 a ton higher; Anderson, Ind., $1 higher.

•F.o.b. Cleveland.

Sheets

Blue Annealed
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh.....2.60c. to 2.70c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills 2.70c. to 2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh.....3.35c. to 3.50c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.60c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh.....4.50c. to 4.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....4.70c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh.....3.40c. to 3.50c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.60c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh.....4.40c. to 450c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.90c.

Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills $5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60
Standard cokes, per base box f.o.b. Elwood, Ind..... 5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.20	20-lb. coating I. C.	$15.50
8-lb. coating I. C.	11.50	25-lb. coating I. C.	17.00
15-lb. coating I. C.	14.35	30-lb. coating I. C.	18.35
		40-lb. coating I. C.	20.35

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb..$2.60
Large, f.o.b. Chicago, base, per 100 lb..... 2.75
Small, f.o.b. Pittsburgh.....70, 10, 5 per cent off list
Small, Cleveland .....70 and 10 to 70, 10 and 5 per cent off list
Small, Chicago .....70 to 70 and 10 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....$43.00
Rails, light, billet, base, per lb.....1.80c.
Rails, light rail steel, base, per lb.....1.65c. to 1.75c.
Spikes, 5/16 in. and larger, base, per 100 lb.....$2.80 to $3.10
Spikes, 1/2 in. and smaller, base, per 100 lb..... 3.10 to 3.40
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, all sizes, base, per 100 lb..... 3.90 to 4.25
Tie plates, per 100 lb..... 2.35 to 2.50
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
1/8	45	19 1/2	1/4 to 3/8	+11	+39
1/4 to 3/8	51	25 1/2	1/2	22	2
1/2	56	42 1/2	3/4	28	11
3/4	60	48 1/2	1 to 1 1/2	30	13
1 to 3	62	50 1/2			

Lap Weld

2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

Butt Weld, extra strong, plain ends

1/8	41	24 1/2	2 to 3	61	50 1/2
1/4 to 3/8	47	36 1/2	1/4 to 3/8	+11	+54
1/2	53	42 1/2	1/2	21	7
3/4	58	47 1/2	3/4	28	12
1 to 1 1/2	60	49 1/2	1 to 1 1/2	30	14

Lap Weld, extra strong, plain ends

2	53	42 1/2	2	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	7
9 and 10	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 1/2 points, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2 1/2 per cent beyond the above discount.

NOTE—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel		*Charcoal Iron*	
2 to 2 1/4 in.	27	1 1/2 in.	+18
2 1/2 to 2 3/4 in.	37	1 3/4 to 1 7/8 in.	+ 8
3 in.	40	2 to 2 1/4 in.	— 2
3 1/4 to 3 3/4 in.	42 1/2	2 1/2 to 3 in.	— 7
4 to 13 in.	46	3 1/4 to 4 1/2 in.	— 9

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes
Cold Drawn

1 in.	60	3 in.	45
1 1/4 and 1 1/2 in.	52	3 1/4 to 3 1/2 in.	47
1 3/4 in.	36	4 in.	50
2 and 2 1/4 in.	31	4 1/2, 5 and 6 in.	45
2 1/2 and 2 3/4 in.	39		

Hot-Rolled

2 and 2 1/4 in.	34	3 1/4 and 3 1/2 in.	50
2 1/2 and 2 3/4 in.	42	4 in.	53
3 in.	48	4 1/2, 5 and 6 in.	48

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.....85 to 87 per cent off list
Carbon 0.30 to 0.40 base.....83 to 85 per cent off list
Plus usual differentials and extra for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage	14 1/4	2 1/4-in. O.D. 10 gage	18
2-in. O.D. 11 gage	15	3-in. O.D. 7 gage	33
2-in. O.D. 10 gage	16	1 1/2-in. O.D. 9 gage	15
2 1/4-in. O.D. 12 gage	16	5 5/8-in. O.D. 9 gage	50
2 1/4-in. O.D. 11 gage	17	5 1/2-in. O.D. 9 gage	52

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 51.50 per cent iron	$4.55
Old range non-Bessemer, 51½ per cent iron	4.40
Mesabi Bessemer, 51.50 per cent iron	4.40
Mesabi non-Bessemer, 51.50 per cent iron	4.25
High phosphorus iron, 51.50 per cent	4.15

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus	44c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	$9.00 to $11.00
Chrome ore, Indian basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f., Atlantic seaboard	22.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	80c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt	$3.00 to $3.15
Foundry coke, f.o.b. Connellsville prompt	4.00 to 4.50
Mine run steam coal, f.o.b. W. Pa. mines	1.50 to 2.00
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Mine run gas coal, f.o.b. W. Pa. mines	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines	1.40 to 1.50
Gas slack, f.o.b. W. Pa. mines	1.50 to 1.60

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid	115.00
Ferrosilicon, 50 per cent, delivered	$82.50 to 85.00
Ferrosilicon, 75 per cent	145.00 to 147.50
Ferrotungsten, per lb. contained metal	90c. to 95c.
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered	11.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent	$33.00
Spiegeleisen, domestic, 16 to 19 per cent	32.00

Ferrosilicon, Bessemer, 10 per cent; $39.50; 11 per cent, $42; 12 per cent, $44.50; electric furnace ferrosilicon, 10 to 11 per cent, $38; furnace with an advance of $1 per unit for material above 10 per cent.

Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $30.50; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	$18.00 to $19.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	19.00 to 20.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton	18.00

Per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$43.00 to $46.00	$40.00 to $43.00
Maryland	48.00 to 50.00	43.00 to 45.00
Ohio	43.00 to 46.00	40.00 to 43.00
Kentucky	43.00 to 45.00	40.00 to 43.00
Illinois	43.00 to 45.00	40.00 to 43.00
Missouri	45.00 to 48.00	38.00 to 43.00
Ground fire clay, per ton		6.50 to 7.50
Silica Brick:		
Pennsylvania		40.00
Chicago		49.00
Birmingham		54.00
Silica clay, per ton		8.00 to 9.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland and Chicago)

Machine bolts, small rolled threads	60 and 10 per cent off list
Machine bolts, all sizes, cut threads,	50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads,	50, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes	50 and 10 per cent off list
Eagle carriage bolts	65 and 10 per cent off list
Lag bolts	60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads	50 and 10 per cent off list
Other style heads	30 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.,	45, 10 and 5 per cent off list
Larger and longer sizes	45, 10 and 5 per cent off list
Hot-pressed nuts, blank or tapped, square	4c. off list
Hot-pressed nuts, blank or tapped, hexagons	4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. off list
Bolt ends with hot pressed nuts	50, 10 and 10 per cent off list
Bolt ends with cold pressed nuts	45, 10 and 5 per cent off list
Washers*	6c. to 5.50c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:	
⅜ in. and smaller, U. S. S.	80, 10 and 5 per cent off list
⅞ in. and larger, U. S. S.	75, 10 and 5 per cent off list
Small sizes, S. A. E.	80, 10, 10 and 5 per cent off list
S.A.E., ⅜ in. and larger	75, 10, 10 and 5 per cent off list
Stove bolts in packages	80 and 5 per cent off list
Stove bolts in bulk	80 and 5 and 2½ per cent off list
Tire bolts	50, 10 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

	Per 100 Net S. A. E.	Per 100 Net U. S. S.		Per 100 Net S. A. E.	Per 100 Net U. S. S.
¼-in.	$0.44	$0.44	⅝-in.	$2.35	$2.40
5/16-in.	.515	.515	⅞-in.	3.60	3.60
⅜-in.	.62	.66	1-in.	5.55	5.80
7/16-in.	.79	.90	1⅛-in.	8.90	8.90
½-in.	1.01	1.05	1¼-in.	12.60	13.10
9/16-in.	1.38	1.42	1⅜-in.	18.35	18.35
⅝-in.	1.70	1.73	1½-in.	21.00	21.00

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws	80, 10 and 5 per cent off list
Milled standard set screws, case hardened,	80 and 10 per cent off list
Milled headless set screws, cut thread	80 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread,	80, 10, 10 and 5 per cent off list
Upset hex. cap screws, S. A. E. thread,	80, 10, 10 and 5 per cent off list
Upset set screws	80, 10 and 10 per cent off list
Milled studs	75 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$35.50
Forging billets, ordinary carbons	$40.50 to 41.00
Sheet bars	37.00
Slabs	35.50
*Wire rods, common soft, base, No. 5 to ⅜-in.	48.00
Wire rods, common soft, coarser than ⅜-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2c. to 2.10c.
Skelp, sheared, per lb.	2c. to 2.10c.
Skelp, universal, per lb.	2c. to 2.10c.

*Chicago mill base is $50. Cleveland mill base, $48.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100 lb.
2100*(1¼% Nickel, 10 to 20 per cent Carbon)	$3.00 to $3.25
2300 (3½% Nickel)	4.50 to 4.75
2500 (5% Nickel)	6.00 to 6.25
3100 (Nickel Chromium)	3.50 to 3.65
3200 (Nickel Chromium)	5.50
3300 (Nickel Chromium)	7.50 to 7.75
3400 (Nickel Chromium)	6.50 to 6.75
5100 (Chromium Steel)	3.50
5200*(Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.25 to 4.50
6100 (Chromium Vanadium spring steel)	4.25
9250 (Silicon Manganese spring steel)	3.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	4.25 to 4.50
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	3.75
Chromium Molybdenum spring steel (1—1.35 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

FABRICATED STEEL

Nearly 54,000 Tons Awarded and New Inquiries for 19,000 Tons

Bookings of fabricated steel work reported to THE IRON AGE bulk large even without including the 17,500 tons, more or less, for the New York Edison Co. They total nearly 54,000 tons and make the week's business the largest so far this year. Not including the public service corporation purchases, business and industrial buildings account for over 20,000 tons, public work for nearly 8000 tons and railroads for 2200 tons. New inquiries call for nearly 19,000 tons. Awards include:

New York Edison Co., power plant at Fourteenth Street and East River, New York, 15,000 to 20,000 tons, to Post & McCord; fabrication to be done by American Bridge Co.

New York *Evening Post* Building, West, Washington and Carlisle Streets, New York, 4000 tons, to Taylor-Fichter Steel Construction Co.; fabrication to be done by Bethlehem Steel Corporation.

Adelson Building for millinery trade, Sixth Avenue at Thirty-ninth Street, New York, 3000 tons, to Hay Foundry & Iron Works.

Garage on Thirty-fourth Street, New York, 1000 tons, to Levering & Garrigues Co.

Office building at Broadway and Seventy-first Street, New York, 200 tons, to A. E. Norton, Inc.

Garage at 137 West 108th Street, New York, 400 tons, to Easton Structural Steel Co.

Apartment building, 82 Washington Square, New York, 300 tons, to Taylor-Fichter Steel Construction Co.

Apartment building, 1225 Park Avenue, New York, 1100 tons, to Taylor-Fichter Steel Construction Co.

Seaboard Air Line, bridges, 700 tons, to Virginia Bridge & Iron Co.

Delaware, Lackawanna & Western Railroad, bridges, 800 tons, to American Bridge Co.

Theater, Miami, Fla., 150 tons, to Lehigh Structural Steel Co.

Warehouse, Terryville, Conn., 275 tons, to Berlin Construction Co.

Office building, Philadelphia, 150 tons, to American Bridge Co.

Central Railroad of New Jersey, bridges, 175 tons, to American Bridge Co.

Power house, Saxton, Pa., 550 tons, to Shoemaker Bridge Co.

Aberfoyle Mfg. Co., Chester, Pa., plant addition, 800 tons, to Bethlehem Fabricators, Inc.

Boston & Albany Railroad, bridges, 400 tons, to Boston Bridge Works.

Highway bridges in South Carolina, 250 tons, to Roanoke Bridge Works.

Johns Hopkins Hospital, Baltimore, Nurses' Home, 800 tons, to a local fabricator.

Power house at Lowell, Mass., Stone & Webster, engineers, 175 tons, to Jones & Laughlin Steel Corporation.

McCaskey Register Co., Alliance, Ohio, factory, 260 tons, to Alliance Structural Co.

City of Cleveland, fire station, 110 tons, to Fort Pitt Bridge Works.

Highway bridge, Gassaway, W. Va., 250 tons, to American Bridge Co.

Bridge over Ohio River at Huntington, W. Va., 3500 tons, to Mt. Vernon Bridge Co.

Apartment house, Sacramento and Powell Streets, San Francisco, 1500 tons, to Dyer Brothers.

J. C. Theilacker, Milwaukee Manufacturers' National Bank Building, Rockford, Ill., 800 tons, to American Bridge Co.

Stresenreuter Brothers, Chicago, seven duplicate highway spans across Des Plaines River, Summit, Ill., 331 tons, to American Bridge Co.

Chicago, Rock Island & Pacific, renewal of roof of Harrison Street Power Plant, Chicago, 149 tons, to Hansell Elcock Co.

Armour & Co., smoke house, section 20, Union Stock Yards, Chicago, 144 tons, to Hansell Elcock Co.

Commonwealth Steel Co., alterations to 450-ton coal storage bin and boiler house, Granite City, Ill., 119 tons, to unnamed fabricator.

Rice Hotel, Houston, Tex., seventeen-story annex, 1000 tons, to unnamed fabricator.

Mossdale Bridge, Stockton, Cal., 400 tons, to Minneapolis Steel & Machinery Co.

Celite Products Co., Lompoc, Cal., 200 tons, to McClintic-Marshall Co.

Apartment House, Post near Leavenworth Street, San Francisco, 200 tons, to Central Iron Works.

Vista Irrigation District pipe line, San Diego County, Cal., 983 tons, to Western Pipe & Steel Co.

Hills Brothers, San Francisco, 340 tons for coffee bins, to Steel Tank & Pipe Co.

Wilson Theater, Fresno, Cal., 120 tons, to Mortenson Construction Co.

Eureka School, Eureka, Cal., 100 tons, to Eureka Boiler Works.

Emsco Steel Products Co., Los Angeles, 1000 tons for stock, to an Eastern mill.

Seattle, Wash., pipe line, 135 tons, to Willamette Iron & Steel Co.

Consolidated Gas Co., three coal handling bridges, 3000 tons, to Brown Hoisting Machinery Co.

Baltimore Police Headquarters, 1700 tons, to Dietrich Brothers.

Germantown Hospital, Germantown, Philadelphia, 1000 tons, to Shoemaker Bridge Co.

Standard Oil Co., stills, Whiting, Ind., 1000 tons, to Struthers Wells Co., and 1000 tons to James G. Heggie & Sons.

Bennie-Dillon Building, Nashville, Tenn., 650 tons, to International Steel & Iron Co.

Theater, Milwaukee Avenue and Rockwell Street, Chicago, 950 tons, to A. Bolters Sons Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Loft building, West Forty-seventh Street, New York, 1000 tons.

Telephone building, South Orange, N. J., 300 tons.

116th Precinct Police Station, Borough of Queens, New York, 300 tons.

Garage, 3 East 102nd Street, New York, 800 tons.

Y. M. C. A. Building, Brooklyn, 200 tons.

Cambridge Building, Fifth Avenue and Thirty-third Street, New York, 1200 tons.

Pentz Realty Co., office building at St. George, Staten Island, New York, 200 tons.

Garage at Bridge and Plymouth Streets, Brooklyn, 150 tons.

Garage, Norwalk, Conn., 200 tons.

Charles Pfizer & Co., Brooklyn, manufacturing building, 600 tons.

Baltimore & Ohio Railroad, bridges, 200 tons.

Standard Oil Co. of New Jersey, miscellaneous structural work, 1800 tons.

Standard Oil Co. of Louisiana, shop at New Orleans, 200 tons.

American Locomotive Co., hammer shop at Dunkirk, N. Y., 600 tons.

Pennsylvania Railroad, bridges, 150 tons.

Garage, *Cincinnati Times-Star*, Cincinnati, 100 tons.

Wabash Railway, ferry boat, 3500 tons.

Standard Oil Co. of Indiana, stills, Casper, Wyo., 1500 tons.

Bridge, Ralston, Okla., 1000 tons.

St. Louis Southwestern Railroad, oil storage tanks in Texas, 700 tons.

New York, Chicago & St. Louis, viaducts, Bloomington, Ind., 400 tons.

Hotel, six stories, Ellis near Hyde Street, San Francisco, 125 tons.

Roosevelt Theater, Oakland, Cal., 200 tons.

High school auditorium addition, Stockton, Cal., 100 tons.

Hendricks Bridge, Lane County, Eugene, Ore., 190 tons.

Garage addition, South Hill Street, Los Angeles, 450 tons.

Vista Irrigation District, San Diego County, Cal., 300 to 500 tons of plates for pipe line, bids April 22.

Southern Pacific Co., San Francisco, 190 tons.

Southern Pacific Equipment Co., San Francisco, 250 tons.

Ventura Refining Co., San Francisco, two 80,000-bbl. tanks, 600 tons.

Nickel Plate Railroad, bridge at Bloomington, Ill., 400 tons.

Federal Land Bank, Louisville, Ky., 500 tons.

The Elwell-Parker Electric Co., Cleveland, has appointed Gates & Glassbrook, 201 Dooly Block, Salt Lake City, Utah, as district representative for that territory and the C. T. Patterson Co., Ltd., New Orleans, district representative for the territory contiguous to New Orleans.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
April	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
8.....	13.75	13.37½	50.87½	8.15	7.85	7.50	7.15
9.....	13.75	13.37½	50.50	8.12½	7.80	7.50	7.15
11.....	13.75	13.37½	....	8.12½	7.80	7.47½	7.12½
13.....	13.75	13.37½	50.50	8.10	7.75	7.47½	7.12½
14.....	13.75	13.37½	50.00	8.05	7.70	7.47½	7.12½

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, April 14.

The inactivity which has been characteristic of most markets for several weeks has been intensified by the Easter holidays here and in London. Copper has been quiet and nearly stationary, with tin demand moderate at lower prices. Lead has continued to slowly sag. Zinc is the steadiest market, but sales are light. Practically no business was done on Good Friday, April 10.

Copper.—Consumers of copper, particularly domestic, are buying only for immedate needs and these are not large. Demand for export has been better than for domestic consumption, with some fair sales reported. Prices have been realized up to 13.60c. to 13.65c., f.a.s. Producers generally are asking and obtaining 13.62½c., delivered, from domestic consumers and the market is firm at this level. The opinion is .e freely expressed that stocks of consumers are not .arge and that when a buying movement starts it will be of good proportions. While statistics for March for refined copper are favorable for producers, they are not stimulating buying by consumers. The fact that the output of blister copper in March was very large is pointed to as unfavorable. Lake copper is quoted largely nominal at 13.75c., delivered.

Tin.—Because the Easter holidays in London extend from Friday to Tuesday and because the tin market here is so intimately connected with the one there, transactions have been light, possibly 500 tons for the week. The heaviest buying was on Thursday, April 9, when 250 tons changed hands. On that day also 75 tons for April-May shipment was sold on the New York Metal Exchange for 50.15c. Since then the market has been stagnant, with no features of interest. Spot Straits tin today is quoted at 50c., New York. London quotations, the first since Thursday, were about £3 per ton less than a week ago, with spot standard tin quoted at £229 5s., future standard at £232 5s. and spot Straits at £235 5s. The Singapore price yesterday was £235. Arrivals thus far this month have been 1755 tons, with 3368 tons reported afloat.

Lead.—Only a moderate business is reported, with sellers following up inquiries eagerly. The market is quiet and heavy and gradually lower, with metal available in the outside market from 7.70c. to 7.75c., St. Louis, and 8.05c. to 8.10c., New York. The leading interest continues to quote 8.25c., New York, as its contract price.

Zinc.—Statistics for March of the American Zinc Institute reveal a strong position for slab zinc. Only a slight increase in stocks was reported and the quantity in smelters' hands at the end of the month was only about ten days' supply. This is one reason for the general firmness of the market, in which prime Western is quoted at 7.12½c. to 7.15c., St. Louis, or 7.47½c. to 7.50c., New York. Demand from consumers is not large, but the market is firm and steady.

Nickel.—Shot and ingot nickel in wholesale lots are quoted at 31c. to 32c. per lb., with electrolytic nickel available at 38c.

Antimony.—Wholesale lots of Chinese metal for spot delivery are available at 13.50c., New York, duty paid, with April-May shipment quoted and sold at 12c. Fairly large arrivals are in prospect within the next 30 days.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., delivered.

Old Metals.—Inquiry is better and prices are higher. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	13.25
Copper, heavy and wire	12.25
Copper, light and bottoms	10.50
Heavy, machine composition	10.00
Brass, heavy	8.25
Brass, light	7.00
No. 1 red brass or composition turnings	9.50
No. 1 yellow rod brass turnings	8.75
Lead, heavy	7.00
Lead, tea	5.50
Zinc	4.50
Cast aluminum	19.00
Sheet aluminum	19.00

Chicago

April 14.—Lead and antimony have declined in a quiet market. All other prices, both on virgin and old metals, remain the same as a week ago. Current buying is almost exclusively for spot shipment. A considerable tonnage of lead was bought, representing delayed purchases, but nevertheless that metal again declined. A recession in foreign demand for lead is said to be responsible. We quote, in carload lots: Lake copper, 14c.; tin, 52c.; lead, 7.80c.; zinc, 7.15c.; in less than carload lots, antimony, 15.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9c.; red brass, 8c.; yellow brass, 7c.; lead pipe, 6.50c.; zinc, 4c.; pewter, No. 1, 28c.; tin foil, 30c.; block tin, 38c.; all buying prices for less than carload lots.

Crocker Brothers Take Charles A. Reed and Louis H. Miller into Partnership

Crocker Brothers, who have been merchants selling pig iron, coke and ferroalloys for many years, with headquarters in New York at 21 East Fortieth Street and offices in Boston, Philadelphia and Cincinnati, have taken into their partnership Charles A. Reed, Boston, and Louis H. Miller, New York, of the company Reed, Fears & Miller, Inc., which has been engaged in the selling of pig iron and coke, with offices in New York, Boston and Philadelphia. Reed, Fears & Miller, Inc., will now retire from business and its New York and Philadelphia offices will be closed. The members of the firm of Crocker Brothers will be D. Fairfax Bush, George A. Crocker, J. Bentley Cueman, Charles B. Newcomb, L. H. Atkinson, Charles A. Reed and Louis H. Miller.

Crocker Brothers started in business in 1854, the firm being founded by the late George A. Crocker, who died in 1906. His brother, William A. Crocker, was for a time associated with the business, and died in 1886. The present member of the firm, George A. Crocker, is a son of the founder. Mr. Newcomb, who is the manager of the Philadelphia office, was admitted to partnership in 1920 and Mr. Cueman of the Boston office, Jan. 1, 1925.

The firm of Reed, Fears & Miller was organized in 1912 by Charles A. Reed, Louis H. Miller and Albert S. Fears, all of whom had been employed by the firm of N. S. Bartlett & Co., Boston. The business was incorporated in 1917. Mr. Fears died in the same year.

The correspondence course in personnel management offered by the La Salle Extension University, 4046 South Michigan Avenue, Chicago, is described in a 48-page booklet under the title of "Personnel Management, the Science of Human Engineering." Hugo Diemer is director of the course and the advisory council is made up of experienced personnel and employment managers. The course includes material under the general subjects of employment methods, employee maintenance, training, service, incentives and personnel policies.

PERSONAL

George W. Jones, assistant general manager of sales, Pittsburgh Steel Co., Pittsburgh, has been elected president of the Triangle Club, a Pittsburgh organization of jobbers, dealers and manufacturers of mill, mine, plumbing, heating, hardware and machinery supplies, formed about a year ago for the purpose of promoting good fellowship among those engaged in these business activities. C. S. Pitkin, Pittsburgh district manager of the Crane Co., Chicago, is vice-president and Ernest S. Cox, secretary-treasurer, while Robert F. Hunter, Hurkill-Hunter Co.; W. T. Todd, Jr., Somers-Fitler & Todd Co.; E. C Edmundson, Williams & Co.; W. H. Harris, Pittsburgh Gage & Supply Co., and G. W. Christopher, Pittsburgh district sales agent of the Youngstown Sheet & Tube Co., comprise the board of governors.

Henry R. Betts, for nine years with the Illinois Tool Works, Chicago, has been made vice-president and sales manager of the Midwestern Tool Co., Chicago, manufacturer of hobs, milling cutters, etc. For seven years prior to his connection with the Illinois Tool Works he was with the Union Twist Drill Co., Athol, Mass.

R. F. Shaw has joined the sales force of the Kearney & Trecker Corporation at Chicago.

R. M. Jones, formerly in the engineering department of the Inland Steel Co., Indiana Harbor, Ind., has joined the sales force of Manning, Maxwell & Moore, Inc., at Chicago.

Directors Alvermann and Lautenbusch of the Phoenix Works, Dusseldorf, Germany, arrived in the United States, April 11, for a five weeks' visit to important steel works in this country. Their headquarters, as for mail, will be the offices of R. S. Stokvis & Sons, Inc., 17 Battery Place, New York.

William Pestell, connected with the sale of Riley stokers since the formation of the Riley Stoker Corporation, has been made a vice-president of the corporation. He will continue to supervise sales.

Gordon S. Rentschler, who recently became vice-president and assistant to the president of the National City Bank of New York and the National City Co., has been elected chairman of the board of the Hooven, Owens, Rentschler Co., maker of steam engines, compressors, etc., Hamilton, Ohio. George A. Rentschler, Jr., was elected president and John H. Black, who was secretary, becomes secretary-treasurer. Frederick B. Rentschler was made a director and vice-president.

George H. Thompson, for the past 15 years connected with the Swartwout Co., Cleveland, for 11 years in charge of its New York branch, has been appointed general sales manager, with headquarters in Cleveland.

H. E. Neubauer, formerly assistant chief engineer of the Buffalo Foundry & Machine Co., later vice-president of the O. S. Sleeper Co., Inc., has become associated with the Chemical & Vacuum Machinery Co. as chief engineer.

C. E. Skinner, assistant director of engineering, Westinghouse Electric & Mfg. Co., has gone to Europe to attend the meeting of the International Electrotechnical Commission to be held at the Hague, Holland, April 16 to 24, inclusive. At this meeting, at which 15 or more countries will be represented, international standardization of rating of electrical machinery, traction motors, transformer oil tests, high tension insulators and standard transmission pressures will be considered.

C. P. Lieblein has been appointed manager of the machinery department of the W. M. Pattison Supply Co., Cleveland, succeeding E. F. Eilers, who has resigned.

G. S. Tracy has been appointed advertising manager of the National Acme Co., Cleveland, succeeding L. E. Honeywell, who recently resigned. The latter has become advertising and sales promotion manager of the Sterling Mfg. Co., Cleveland, builder of electrical equipment for automobiles and radio equipment.

Francis E. Symons, president Ralston Steel Car Co., Columbus, Ohio, reported at the annual meeting of stockholders on April 7 that business in 1924 had been very satisfactory in view of conditions throughout the country. Officers elected also included Frank A. Livingston, vice-president and treasurer, and L. C. Roy, secretary and assistant treasurer.

Fred Hubbard, formerly chief civil engineer of the Carnegie Steel Co. in the Youngstown district, has become associated with the Standard Slag Co., Youngstown, in its research department.

James A. Campbell, president Youngstown Sheet & Tube Co., Youngstown, will be chairman of a meeting on April 24 in that city, to be addressed by Senator William M. Butler of Massachusetts. Mr. Butler will meet leading manufacturers of the Mahoning Valley at a dinner arranged in his honor by Mr. Campbell.

James Van Buskirk has been transferred from the Detroit office of the Harnischfeger Corporation (formerly Pawling & Harnischfeger Co.) to take charge of the office just established in Birmingham at 431 First National Bank Building. H. E. Mensch has been placed in charge of the Detroit office.

John Daker, who has been Cleveland district sales manager of Eaton, Rhodes & Co., pig iron brokers, who have discontinued their Cleveland office, has been appointed Cleveland district sales manager of the Ashland By-Products Coke Co., succeeding Samuel Weiss, who has been transferred to Buffalo.

William B. Schiller, president National Tube Co., Pittsburgh, is back at his desk after a two months' Mediterranean cruise, which included a visit to Egypt and the Holy Land.

James S. Hartness, president Jones & Lamson Machine Co., Springfield, Vt., who was a patient at the Phillips House, Massachusetts General Hospital, Boston, for many weeks following a serious operation, has returned to his home.

Frank P. Callaghan, chief engineer for the Foote Brothers Gear & Machine Co., Chicago, left on April 4 for Cuba on a business trip involving engineering work for the company in that territory.

Thomas J. Llewelyn has been appointed Pittsburgh representative for the R. S. Newbold & Son Co., Norristown, Pa. He was formerly connected with the Treadwell Engineering Co. and has had considerable experience in the operating end of the steel industry. His offices are at Room 530 Union Trust Building, Pittsburgh.

E. M. Poston, Columbus, Ohio, has been elected a director of the Wellston Iron Furnace Co., Wellston, Ohio. Mr. Poston has been interested in electric power production in central Ohio for many years.

R. C. Phillips of the American Rolling Mill Co. sailed recently for France en route to Italy on business for the Armco International Corporation.

E. W. Nick, president Northern Equipment Co., Erie, Pa., has been elected president of the Lakeview Drop Forge Co., Erie. W. J. Brenner has been elected vice-president and G. C. Miller, secretary-treasurer.

Ralph E. Blazo, manager of the Philadelphia office of Reed, Fears & Miller, Inc., whose absorption by Crocker Brothers is announced elsewhere in this issue, will become associated with Barrows & Co., Bankers' Trust Building, Philadelphia, selling agents for coal, coke and pig iron. Mr. Blazo will have charge of pig iron sales and will be a partner in the business. Mr. Blazo has been engaged in pig iron selling since 1908, when he became connected with Rogers, Brown & Co. He was with that firm in Boston and in Philadelphia until 1918, when he went with Reed, Fears & Miller, Inc., and was with the latter in Boston for several years before becoming manager of the company's Philadelphia office. Barrows & Co. is headed by W. A. Barrows, 3rd, formerly with the Thomas Iron Co. (now the Reading Co.), Goshen Furnace Corporation and E. Arthur Tutein, Inc., having until about a year ago been connected with the Philadelphia office of the latter.

Industrial Engineers' Convention

"Problems of Management Today" is designated as the major subject of the twelfth national convention of the Society of Industrial Engineers, to be held at the Hotel Winton, Cleveland, May 6, 7 and 8. Afternoons will be devoted largely to plant inspection trips, 10 of which are planned.

"Production Management by Organization Rather Than System," by W. B. Ferguson, Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is one of the addresses scheduled for the opening meeting. At a session on marketing problems, to be held in the evening, L. V. Britt, general sales manager, Burroughs Adding Machine Co., Detroit, will be one of the speakers, his subject being the "Development and Supervision of the Field Force." Following the banquet on the evening of Thursday, May 7, Frank A. Scott, president of the Warner & Swasey Co., Cleveland, will speak on the "Responsibilities of Management," and A. A. Hamerschlag, president of the Research Corporation, New York, will discuss "The Personal Equation in Business."

Simultaneous group meetings are planned for Friday morning, May 8. Three papers, one of which is on "Selling the Financial Program to the Production Man," by Noyes D. Farmer, treasurer, Austin Machinery Co., Muskegon, Mich., will be presented before the accountants' group. The industrial relations group will discuss papers on unemployment insurance, vacations for wage earners and industrial pensions. On the latter subject, J. A. Morford, National Industrial Conference Board, New York, will contribute a paper on the "Cost and Administration of Industrial Pensions." At a research committee dinner meeting, Dr. C. S. Yoakum, Carnegie Institute of Technology, Pittsburgh, will speak on "Future Research in Labor Management." R. S. Perry, Hudson Motor Car Co., Detroit, and Mrs. L. M. Gilbreth, Montclair, N. J., will lead in the discussion of Dr. Yoakum's paper.

A session on labor problems will follow the research committee dinner. A paper on "How Best to Secure the Cooperation of the Foreman in the Improvement of Personnel Methods" will be presented by C. E. Watkins, personnel director, Muncie Products Division, General Motors Corporation, Muncie, Ind. A comprehensive paper is on "How to Obtain Good Men and Fit Them to the Right Job," to be read by Dr. C. A. Lippincott, manager, cooperative department, Studebaker Corporation. Dr. Lippincott will outline policies which cause good men to apply for employment, methods that assure correct selection and placement, and methods of selling the organization to the new employee. C. M. Ripley, General Electric Co., Schenectady, will present a paper on "Interpreting Business to the Workers," which paper will be illustrated by stereopticon slides.

The plants that will be visited include the White Motor Co., Jordan Motor Car Co., National Lamp Works of the General Electric Co., National Tool Co., American Multigraph Co., and the Apex Electric Mfg. Co. On Saturday, May 9, there will be an excursion to the plant of the B. F. Goodrich Co., Akron, Ohio.

OBITUARY

ELWOOD HAYNES, inventor of America's first automobile and known widely as scientist and metallurgist, died April 13 at his home in Kokomo, Ind. Born at Portland, Ind., in 1857, he attended Worcester Polytechnic Institute, Worcester, Mass., and Johns Hopkins University. He was particularly well known for his development of stellite, a high speed metal cutting material, which was numbered among his discoveries of alloys of cobalt, chromium molybdenum and tungsten. He was a member of numerous engineering and scientific societies and through them and otherwise contributed to the progress of engineering in a very material way.

ELWOOD HAYNES

ALFRED L. LOVEJOY, for the past 12 years New York district manager of sales for the Pratt & Whitney Co., machine tool manufacturer, and who was identified during the greater part of his life with the machinery business, died on April 6 at his home in Greenwich, Conn. Mr. Lovejoy had been in poor health for several months and had undergone one or two operations. A few weeks ago his condition necessitated his remaining at home. Heart failure was the immediate cause of death.

GEORGE C. HOLMGREEN, vice-president Alamo Iron Works, manufacturer of machinery and supplies, San Antonio, Tex., died at the Santa Rosa Infirmary on March 31. He was born in San Antonio in 1884 and became associated with his father in business. He was also president of the Alamo Steel Supply Co., Houston, Tex., an affiliated interest of the Alamo Iron Works. At the time of death Mr. Holmgreen was a director of the San Antonio Chamber of Commerce. He was active in civic affairs and prominent in the thirteenth district (all of Texas) Rotary clubs, of which he was district governor in 1921-22.

JOHN JOSEPH REDMOND, vice-president in charge of sales and a director of the Fulton Iron Works, St. Louis, died at Reclife, Brazil, on April 8, after an illness of two weeks. He was 29 years old and had been in the employ of the company since 1915. He was in South America on a business trip since last September and was expected to return in a few months.

R. E. SANDERS, Ashland, Wis., a pioneer foundryman and boiler works operator, died April 4 on a train at Minneapolis while being taken to the Mayo Clinic at Rochester, Minn., for treatment. He had been ill several months.

H. G. VANNOSTRAND, since last June associated with the railroad sales bureau of the Illinois Steel Co., Chicago, and for several years prior to that identified with the Railroad Supply Co., Chicago, died recently.

CALVIN L. OHL, aged 34, an assistant superintendent of sheet mills at the East Youngstown plant of the Youngstown Sheet & Tube Co., died last week following a short illness of bright's disease. He had spent his entire life in the sheet industry of the Mahoning Valley.

HERMAN F. BRANDES, president and treasurer of the Springfield Mfg. Co., Bridgeport, Conn., died on April 8, aged 63 years.

DAVID G. EVANS, who rose from common laborer for La Belle Iron Works, Steubenville, Ohio, to manager of the plant, now the Steubenville works of the Wheeling Steel Corporation, died in Wheeling, W. Va., April 14. He was born in New Castle, Pa., 71 years ago.

JAMES W. GRANT, retired inventor and manufacturer, regarded as the designer of the hook and eye machine, died April 8 after a brief illness at his home in Bridgeport, Conn. He also designed and made machines for the lock department of the United States Government. He was once superintendent of the E. S. Hotchkiss Mfg. Co. and was founder of the Special Machinery Co., Bridgeport, of which he was president for more than 25 years.

HARRY S. CANTROVITZ, for 25 years a member of the Western Rawhide & Belting Co., Milwaukee, died March 28, aged 62 years. He was born in LaCrosse, Wis., and became associated with the Milwaukee company in 1900, serving as president until his retirement about two years ago.

Supreme Court Sustains Employers

(*Concluded from page* 1141)

ings in San Francisco during the same time, their weight, as evidence to establish a conspiracy to restrain interstate commerce or to establish such restraint in fact, becomes so insignificant as to call for the application of the maxim *de minimis non curat lex*, to extend a statute intended to reach and suppress real interferences with the free flow of commerce among the States to a situation so equivocal and so lacking in substance would be to cast doubt upon the serious purpose with which it was framed."

Kansas Court Ruled Against

In another important decision the Supreme Court unanimously decided that the compulsory system of arbitration enacted into law by the Kansas Legislature when it created the Industrial Court violated the rights guaranteed both to employer and employee under the Federal Constitution.

In a long decision, read by Associate Justice Van Devanter, the Supreme Court held that the Kansas Legislature had no authority to pass a law requiring an employer, even in an industry affected by a public interest, to remain in business whether making or losing money if he did not wish to do so and that there was a similar lack of legal authority in the Legislature to compel an employee to work for an employer if he desired to seek employment elsewhere.

The decision of the Federal Supreme Bench reversed that of the Kansas Supreme Court, which had upheld the Industrial Court by granting a writ of mandamus to compel the Charles Wolff Packing Co. to put into effect an order regarding wages and hours of labor in the company's slaughtering and packing plant.

NEW TRADE PUBLICATIONS

Pumps.—Connersville Blower Co., Connersville, Ind. A 4-page illustrated bulletin covering the company's line of Cycloidal rotary pumps of the smaller types. In addition to tables of sizes, capacities, speeds, etc., the bulletin describes the construction and design of these pumps, outlining their particular advantages for certain classes of work.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. A 4-page bulletin illustrating and describing New Departure ball bearings, and in particular their use on electric motors. The information is given that all motor manufacturers will now supply motors in which New Departure ball bearings are used.

Welding Torch.—Bastian-Blessing Co., 240 East Ontario Street, Chicago. A reprint in colors showing the new Rego automatic shut-off torch manufactured by this company. The advantage claimed for this torch is that it prevents waste of gas. When the operator is ready to weld he simply presses a button; a touch of the thumb and out goes the flame when it is no longer to be used.

Pyrometers.—Republic Flow Meters Co., 2240 Diversey Parkway, Chicago. Catalog of 56 pages and cover going into great detail in connection with the design and use of pyrometers for all applications. This is printed in colors, one feature being a color-temperature scale, connecting the appearance in the dark of high temperature articles with the measurement of temperature in deg. Fahr. Samples are given of log sections for recording pyrometers, together with descriptions of the pieces of apparatus involved, with details of parts of the apparatus, methods of installation, wiring diagrams and other matter of interest to the user. Heat treatment specifications of the S. A. E. are given in some detail; also melting points of chemical elements, fusion points of Seger cones and other matter likely to be of use in the heat treatment of steel or other materials.

Track Material.—Walter A. Zelnicker Supply Co., St. Louis. Bulletin 331 consists of a folder covering track material, including rails, fish plates, sheet steel piling, as well as locomotives, cars, steam shovels and a wide variety of other material, including contractors' equipment, which is available for sale.

Machine Molded Gears.—Poole Engineering & Machine Co., Baltimore. Four-page bulletin under title of "Do You Know How Poole Gears Are Made?" describes and illustrates the method and equipment used in making molded gears.

Vacuum Pumps.—Weinman Pump Mfg. Co., Columbus, Ohio. Bulletin No. 200 with data on the type HH automatic centrifugal vacuum and boiler feed units. A recent installation of this equipment is illustrated.

Welding Flux.—Chemical Treating Co., 26 Broadway, New York. Eight-page booklet outlining the advantages of Welflex, which is a general welding flux for iron, steel and bronze.

Non-Sticking Valves for Caustic Solutions

The difficulties of stopcocks sticking when used in systems handling caustic solutions has been solved by the General Electric Co. by the use of Genelite as a facing for the rotating part of the valve. The material is described as self-lubricating to a certain extent.

Considerable trouble was experienced with valves in the oxygen and hydrogen producing plant of the company. Valves stuck, and needed to be disassembled and sometimes destroyed after they had been used in caustic systems. Valves with Genelite facings were found to operate freely after 18 months of service. Such units can be used with practically any solution that will not attack bronze.

Genelite is a synthetic bronze, having uniformly distributed throughout its mass approximately 40 per cent by volume of very finely divided graphite. It was developed in the research laboratory of the General Electric Co. a few years ago as an improved bearing alloy. Although the material has the appearance of bronze, it is machined with difficulty; it can, however, be ground easily. High pressure and heat are used in molding it.

Purchases Control of Crawfordsville Wire & Nail Co.

CHICAGO, April 14.—The Sommer family, which owns the controlling interest in the Keystone Steel & Wire Co., Peoria, Ill., together with others has purchased a controlling interest in the Crawfordsville Wire & Nail Co., and expects to continue the operation of the plant at Crawfordsville, Ind. C. D. Voris, who has been secretary and general manager of the Crawfordsville plant for many years, will continue to be in charge of the management.

The Engineering Societies Library, housed in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, obtained financial aid in the past year from a number of industrial concerns. This was for support beyond the regular contributions made by the constituent engineering societies operating the library. According to the annual report of the library, it appears that great headway has been made toward cataloging some old accumulations of books and papers, that increasing use is being made of the library's facilities for making researches and that members of the societies distant from New York may borrow books, which are delivered by mail at a nominal charge. The companies which gave financial assistance include the following: American Brass Co., American Car & Foundry Co., Anaconda Copper Mining Co., Bethlehem Steel Co., Brown Co., Cutler Hammer Mfg. Co., Detroit Edison Co., Ford, Bacon & Davis, International Nickel Co., Miami Copper Co., New Jersey Zinc Co., Singer Mfg. Co., Standard Oil Co. of New Jersey, Wadsworth Watch Case Co., Western Electric Co.

Characteristics of Industrial Floorings

(*Continued from page* 1127)

iron or copper filings trowelled into the surface will generally increase its life. The weight of filings necessitates careful handling and trowelling to prevent their settling below the surface.

Patented Concrete Floors

Owing to the difficulty of securing a good cement floor by ordinary methods, a number of patented processes have been developed. One of the most successful of these is as follows:

The sub-floor is brushed with stiff wire brooms immediately after the concrete has set to remove laitance and scum, together with loose waste material, exposing the firm, bone-clean concrete surface and leaving it evenly scored and pitted, thus assuring uniformity of bond. Grease, oil and similar substances that resist removal by brooming are eliminated by mechanical chipping and scouring.

All material used, cement, sand and aggregate, is mixed in a stationary drum type mixer, using only enough water to produce a dense, workable and flowing mixture. This mixture is spread smoothly, struck off to level, and at once covered with burlap in strips laid with overlapped edges. Then a dry mixture of cement and sand is spread on the burlap to about 1 in. depth. This mixture acts as a blotter to draw to the surface and absorb all excess water. This process requires about 20 min., and the burlap is then removed, leaving the surface in a plastic state, ready for finishing, well in advance of the initial setting of the cement.

Immediately after the burlap is removed the surface is compacted by heavy electrically operated disc floats and then hand trowelled with steel trowels. The surface is saturated from 7 to 14 days. It is then allowed to dry and treated with some liquid hardener. The process described is protected by patent.

Limitations of Concrete Floors

Olive, whalebone and wood oils, tallow, organic fertilizers and manure have a tendency to attack freshly laid concrete, but after it is one month old it is generally immune. Mineral oils derived from distillation of coal products have no action on cement unless some acid is present. Even weak acids, like vinegar (in large quantities), have a destructive effect. Alkalies like potash and soda have no action, but ammonia salts tend to roughen the surface.

Where women are employed they almost invariably object to standing or working on concrete floors. This difficulty may often be met by the construction of raised wood panels around the machine.

Magnesite Floors

Magnesite floors consist generally of ½ in. of magnesite cement (a mixture of magnesium oxide and magnesium chloride) laid over a concrete or wood base. This thickness is intended for offices or other light duty. Magnesite is warmer underfoot than concrete, more resilient and non-slippery. It has been installed in a large number of factories, warehouses, office buildings, hotels, etc., and on the decks of ocean going ships. It comes in a number of colors and may be laid in patterns or solid ground with different colored borders, as is the case with all of the special floorings following.

Granolithic and Terrazo Floors

Granite or marble chips mixed with cement and sand placed on a concrete base produce hard and beautifully variegated surfaces, very durable and non-absorbent in nature, respectively known as granolithic and terrazo floors. These finishes are suitable for entrances, lobbies, toilets, restaurants, etc.

Special Floorings

In an effort to obtain a warm and noiseless floor especially adaptable for offices, a number of composition floors have been developed. Some of these consist of short fiber asbestos held in a binder of sodium silicate with or without other aggregate, such as powdered serpentine. A mineral coloring may be added to produce desired effects. Other floors use a sawdust base with a silicate or magnesite binder.

Waterproofing

In the construction of basement or ground floors where water is present in sub-soils, waterproofing is necessary. There are three ways to accomplish this—the integral, the plaster coat, and the membrane methods. In the integral method a filler which closes the pores of the concrete is added to the other materials at the time of mixing. The plaster coat method consists of a waterproof plaster finish over the concrete base. The membrane method is seldom used unless hydrostatic pressure is present. It consists of placing waterproofing felts over a concrete base and a cement finish 2 or 2½ in. thick over the felts. Where water pressure exists, it is also necessary to reinforce the structural slab to resist the lifting action and prevent cracks which would damage the topping and puncture the membrane.

Brick Floors

In localities where the price of paving brick is not excessive the brick floor has some advantages worth considering. When laid with grouted joints it presents a fairly smooth, non-slip surface which will stand excessive heat without cracking. It is easily repaired and adaptable for change of occupancy requiring installation of heavy foundations or change of foundations and consequent tearing up and relaying of portions of the floor.

Wood Floors

In placing any wood floor on a base resting directly on the ground, special precautions, in addition to those outlined for cement floors, must be taken to prevent moisture getting into the floor, as this always causes buckling and rotting. Air spaces should be left between the sub-floor planks and around the walls or other fixed boundaries for ventilation and expansion, since moisture may find its way through the structural slab in spite of waterproofing precautions—water pipes above may leak or other accidents occur.

Maple Floors On Tarred Rock Foundation

In line with the precaution outlined above the two methods of having wood floors directly over the ground have been developed. The first method consists of a tarred rock foundation, a damp-proof course, a 2-in. plank sub-floor and ⅞ or 1⅛ in. maple finish floor. It is constructed in this manner: A foundation course consisting of crushed stone thoroughly machine-mixed with tar is put down, raked to an even surface and rolled to a 4-in. thickness. A damp-proof course, made by mixing dry sand with tar, is spread over the tarred rock foundation 1¼ in. thick, brought to proper level, and toe nailed to it. Over this sub-floor ⅞ or 1⅛-in. factory maple flooring is securely nailed, leaving expansion joints as noted above.

Maple Floors Over Concrete Base

The second method consists of a floor exactly similar to the first except that a concrete base is substituted for the tarred rock foundation. These floors are designed to resist dampness and give firm support for the vibration of heavy machinery. Tools or finished machine parts are not injured by falling on wood floors and the maple surface is suitable for light trucking as well as being warm and resilient underfoot.

Wood Blocks Over Concrete Base

Another type of damp-proof floor consists of 2 or 2½-in. creosoted wood blocks, having at least 8 lb. impregnation, laid in hot pitch directly over a 5-in. stone concrete base which has been floated to a smooth and even finish. This floor will give very good service for heavy trucking and has the advantage of being easily repaired where blocks are worn or damaged. It employs the well known principle that wood has the greatest resistance to wear and shock in a direction

parallel to the grain of the wood. It is somewhat more difficult to attach machinery to this type of floor, since the blocks have a tendency to loosen. It offers a little more resistance to the moving of trucks than maple, but not enough to be objectionable.

It does present a non-slip wearing surface, having a long life under heavy trucking conditions. It does not require any special arrangement at aisle crossing.

Care should be exercised in keeping creosoted blocks dry before laying, as they absorb moisture and have a tendency to shrink and loosen if laid in this condition. If blocks having 12 lb. impregnation are used, absorption is less apt to take place. Blocks used in locations exposed to the weather should always have this amount of impregnation. Expansion joints should be placed along the walls and around machinery foundations.

Attached Wood Blocks Over Concrete Base

This type of flooring consists of wood blocks 2 in. thick, dovetailed to a 1-in. wood sub-floor. It is laid over a concrete base and sleepers in the same manner as maple flooring, except that the wood blocks and the sub-floor are laid at the same time with wood splines between each row of blocks. It may also be laid on a concrete base without sleepers, using a method of lateral nailing which combines all the blocks into one solid floor. These blocks are milled to give a uniform finish similar to a maple floor and at the same time provide a non-slip surface. The blocks will not pull loose and for this reason the floor is suitable for the direct attachment of machinery. Blocks and attached strips intended for interior use are treated with paraffin, thus eliminating the usual objection to the use of creosote in inside work. This floor has given long and satisfactory service in main trucking aisles, elevators, loading platforms, freight cars, etc., and is especially designed for heavy traffic. It can be easily repaired and is becoming more popular each year.

In general, wood floors should not be used where a large amount of water is used in the operations, where acids or alkalies are present, or when heavy materials are to be handled, which would have an abrasive action or cause local damage, necessitating frequent replacement.

Mastic Floors

A mastic floor consists of asphaltic concrete composed of natural asphalt with a binder of cement placed over a brick or concrete base. For factory use the mastic should be laid in a thickness of at least 1 in. and the asphalt percentage should be varied to give a soft underportion and a hard wearing surface. The amount of asphalt in the lower portion should not exceed 10 per cent and the surface 7½ per cent. Mastic floor is intended to withstand heavy trucking and at the same time be sufficiently resilient to increase the efficiency of workmen and remain moisture and waterproof. It should not be laid where cutting or transformer oils are used. Nor should it be laid under heavy storage on account of the tendency to show indentation.

A great deal of experimentation has been done in recent years by manufacturers of mastic floors to perfect a mixture which would not have these objections, and considerable progress has been reported. Mastic cannot be used where the temperature exceeds 110 deg., as the material softens at this temperature. In general, use of mastic is limited to trucking aisles, loading platforms and roadways. If there is an objection to the black color it can be whitened by dusting with cement.

Asphalt Blocks

Asphalt blocks are generally an improvement over asphalt mastic laid in a mass. They eliminate cracking and sponginess, but the other limitations for mastic floors hold for this type of construction and they are more expensive than wood blocks.

To Reduce Varieties of Sheet Metal Ware

Simplification committees of the sheet metal ware industry have begun in earnest the consideration of what items, among the hundreds of varieties now being cataloged by that industry, may be eliminated to the mutual benefit of the manufacturer, distributor and user. Meetings have been held in connection with sessions of the Sheet Metal Ware Association at the United States Chamber of Commerce. The presence of the members in Washington offered opportunity for conferences with representatives of the Federal Specifications Board and the Bureau of Standards, who are directly interested in these commodities.

Studies of simplification possibilities are being taken up in three divisions, one being devoted to enameled ware, one to black iron and galvanized ware and one to tinware. The first is headed by W. Topping of the Columbian Enameling & Stamping Co., Terre Haute, Ind. Fenton Lawson of the F. H. Lawson Co., Cincinnati, is head of the second group, and E. M. Blake of the Central Stamping Co., New York, is head of the tinware committee. The simplification undertaking is a sequel to a meeting of the association last summer in French Lick, Ind., when committees were named. Since that time progress has been made through correspondence, but the recent committee meetings have expedited tentative plans to reduce a large number of items carried in the catalogs of the various firms.

Attendance at the committee meetings included Walter H. Blank, American Can Co., Toledo; Sidney Detmers and C. H. Kent of the Republic Metalware Co., Buffalo, N. Y.; J. O. Entrekin, Wheeling Corrugating Co., Wheeling, W. Va.; Thomas W. Gulley, National Enameling & Stamping Co., Baltimore; N. W. Judkins, Belmont Stamping & Enameling Co., New Philadelphia, Ohio; Fred Morris, Vollrath Co., Sheboygan, Wis.; George M. Schott, Cincinnati Galvanzing Co., Cincinnati; W. S. Smith, Sheet Metal Ware Association, New York; J. H. Stevenson, Lalance & Grosjean Mfg. Co., New York; and C. N. Turner, National Enameling & Stamping Co., Milwaukee.

Commerce of the United States, Sweden and Other Countries

The United States has been the best customer for Swedish iron and steel since the war, according to Axel Walberg, director of the Jernkontoret, the Swedish Iron and Steel Masters Association, in a recent interview with a representative of THE IRON AGE. Prior to the war, said Mr. Walberg, the British were large consumers of Swedish iron and steel, much of this consumption being for the manufacture of munitions and materials of war. Germany and Russia were also large users of Swedish products. While demand from the United States is much reduced, it is nearer to normal than the demand today from Sweden's European markets.

Mr. Walberg spoke particularly of the present American tariff, viewing it with the perspective of many years of contact with American business. In general he said the American tariff was suggestive of the Spanish tariff, the highest in Europe today. Spain, however, is engaged in a vigorous effort to build up an iron and steel industry on a firm basis, which is particularly difficult in view of the lack of the industrial attitude on the part of the people. Mr. Walberg pointed out that a high tariff was sometimes of advantage to temporarily protect a certain product, such as the tariff placed on tin plate in the McKinley administration, which resulted in the creation of the tin plate industry in the United States.

In Europe as in the United States, he said, the increased capacity in the production of iron and steel, resulting from war-time expansion of industry, is an obstacle to steadiness of business, a genuine improvement in demand generally tending before long toward overproduction and a sudden decline in prices.

Mr. Walberg expects to remain in the United States for a month or two, during which time he will make his headquarters at 200 West Fifty-eighth Street, New York.

Four Classes of Die-Casting Alloys

(*Concluded from page* 1123)

excellent properties consists of 2½ per cent copper, 3 per cent nickel and the remainder aluminum. Aluminum alloys can be made with an ultimate tensile strength ranging from 18,000 to 30,000 lb. per sq. in., with an elongation of from ½ to 5 per cent, and a Brinell hardness of from 45 to 100. Test bars ½ in. x 5/32 in. bend from 12 deg. to 180 deg. and support a load on 3-in. centers of from 100 to 200 lb. Their specific gravity ranges from 2.60 to 3.10.

Heat Treatment of Aluminum Castings

These properties, it should be noted, are in the cast condition. The heat treatment of aluminum castings of certain compositions, corresponding to the duralumin type, will increase the strength far above these figures, but so far this heat treatment has been applied mainly to wrought aluminum or to special sand-cast parts. This is because the process of die-casting gives a fine, strong metal structure, due to the chilling effect of the die, and consequently die-castings are always stronger than the same alloy cast in sand.

Aluminum alloys take and retain a high polish and consequently are used for parts which must be ornamental as well as serviceable. Automobile curtain window frames illustrate this point. These frames made of die-cast aluminum retain their polished surface even better than nickel plated parts, and are easily polished up again. Aluminum alloys can be used also for parts which must combine a fair degree of strength and toughness with ornamentation, such as automobile steering wheel spiders and washing machine parts. They are resistant to moisture but are corroded by alkalis or strong acids. They are affected by some organic acids found in foods, but the salts formed are only in minute quantities and are not poisonous, so that the use of aluminum alloys for cooking utensils is common.

The metal used in die-casting alloys should be only virgin metal of the best quality and must be analyzed upon receipt. The formulæ of the metallurgist must be accurately followed; it is well to have one man weigh all charges. Then the alloyed material must be again analyzed to check the possibility of mistakes in mixtures of alloys. This rigid control is essential for quantity production to high standards. The alloys are made up in heats of 3500 lb. each and poured by hand into ingot molds on conveyors. From there they are stacked on the platforms, and when released by the chemist are taken directly to the machines.

Inspection of the castings is another important step. The first inspection should keep up with the casting machine, so that any defects can be corrected before many castings have to be scrapped. Since the production on some of these machines runs as high as 12,000 or even 25,000 castings per day in a multiple cavity die, an hour's run scrapped is too much of a loss to overlook. Such defects as blowholes, cracks in the castings or high dimensions due to the die not closing tightly are caught at the first inspection and corrected. A final inspection just before shipment assures the correctness of the cleaning operations and any machining which it is sometimes necessary to do.

Needless to say, the cleaning of die-castings is a minor operation. Usually it amounts simply to cutting off the gates and fins from the air vents in a trimming die in a punch press; for die-castings are finished accurately as they come from the machine. Sometimes in cases of extreme accuracy a light milling or broaching operation is necessary, and it is always advisable to tap small or fine internal threads.

Comparative Costs Sometimes Elusive

It is impossible to make a general rule for the comparative costs of die-castings and machined parts. A given part may be die-cast to size much more cheaply than it could be machined from a sand casting or forging; on the other hand, another part in the same assembly might be machined cheaper. The greater the number of machining operations necessary on a given part, the greater chance the die-casting has of effecting a large saving. The three castings shown in Fig. 3 weigh respectively 3¼ lb., 10 lb. and 3¾ lb. These castings, made in sand, would have many expensive machining operations which were entirely eliminated by die casting. In the casting at the left the following operations, necessary on the original sand cast part, have been entirely eliminated by die-casting this part:

a. Boring and facing
b. Side facing
c. Drilling four holes
d. Milling four slots

In the large center casting an even greater number of operations was eliminated:

a. Turn stem and machine flange, drilling ⅛ in. hole, counter boring 1 in. deep.
b. Roughing and finishing top face, counter bore 53/64 in. diameter, and ream counter bore for pinion.
c. Milling locking slot.
d. Facing bosses inside.
e. Milling pad for bracing beam.
f. Drilling all eight holes.
g. Inserting one bushing.
h. Assembling with cap, (at left), drilling and reaming horizontal holes.
i. Grinding flush.
j. Disassembling.

Die-casting the right hand casting eliminated the following operations:

a. Facing bottom.
b. Facing all bosses.
c. Milling boss on top.
d. Drilling five holes; spot-ting four holes.
e. Drilling all oil holes.
f. Reaming two holes.

In this case the die-casting was relatively much cheaper than the machined sand casting. Another illustration is of a 10-lb. gear box made in a die, which also shows a large saving over the original machined sand casting. By die-casting the gear box the following operations were eliminated:

a. Straddle milling bottom lugs and top boss.
b. Milling front.
c. Drilling all holes (seven).
d. Counter boring three holes in box and reaming one hole in top.
e. Facing three holes in box-milling inside boss of box.
f. Milling pad for a swivel base bracket.

In die-casting the 2-lb. cover for the gear box these machining operations were made unnecessary:

a. Milling front.
b. Milling bosses.
c. Drilling three bosses.
d. Counter boring bosses.
e. Drilling ten ¼ in. holes and counter sinking holes.

In some cases a certain part has been die-cast at a saving of 60 to 75 per cent of the cost of the same part machined from an ordinary casting or stamped from sheet metal. The only way to determine actually whether a given part can be die-cast cheaper than it is being made at present is to determine accurately the present cost of machining the part and then to compare that cost with a reliable die-casting quotation. It then can be seen which method is the more economical for that particular part and no dependence need be placed upon general statements concerning these relative costs.

There is still much to learn about die-castings. Some day in the future bronzes, brasses and possibly even iron and steel will be die-cast. These metals are even now being cast in permanent molds, and to die-cast them is but another step or two. The future of aluminum and its alloys is a bright one; it is possible that the day is coming when it will largely replace iron and steel as a structural material. When that time comes, aluminum die-casting plants will be as common as gray iron and brass foundries are today.

Electric power production by public utility plants in the United States in February is reported by the Geological Survey at 5005 millions of kwhr. This compares with 5592 in January and 5537 in February. The reduction, after allowing for the shorter month, is less than 1 per cent. About 65 per cent in February was produced by fuels, the rest by water power.

Building permits were issued in St. Louis during last month for improvements of the estimated cost of $4,014,830, against $2,560,825 in March, 1924, a gain of $1,454,005. Of last month's permits, $3,537,110 were for new buildings and $477,720 alterations.

MARCH STEEL OUTPUT

Second Largest on Record—Daily Rate Increase About 3.2 Per Cent Over February

Steel ingot output in March at 160,782 gross tons per day was the second largest in steel history—only 293 tons per day less than the record rate of 161,075 tons per day in March, 1924. The increase of March over February was 4949 tons per day, or about 3.2 per cent, contrasting with an increase of only 0.65 per cent in February over January.

The statistics of the American Iron & Steel Institute show that the March output of the companies which made 94.84 per cent of the country's total in 1923 was 3,964,628 tons. Assuming that the 5.16 per cent not reporting produced at the same rate, a total March production is indicated of 4,180,333 tons. The corresponding annual rate is about 50,003,000 tons, or approximately 92.5 per cent of capacity, against 89.5 per cent in February.

The table gives the production by months of the different kinds of steel, together with the estimated daily rate for all companies.

Monthly Production of Steel Ingots, Reported by Companies Which Made 94.84 *Per Cent of the Steel Ingot Production in* 1923

(Gross Tons)

Months 1925	Open-Hearth	Bessemer	All Other	Calculated Monthly Production All Companies	Approximate Daily Production All Companies
Jan.	3,262,748	689,996	11,960	4,180,413	154,830
Feb.	2,931,964	602,042	13,014	3,740,004	155,833
March	3,336,169	614,860	13,599	4,180,333	160,782
3 mos.	9,530,881	1,906,898	38,573	12,100,750	157,153
1924					
Jan.	2,766,534	667,032	12,577	3,633,639	134,579
Feb.	2,902,641	695,905	14,085	3,809,185	152,367
March	3,249,783	706,801	15,260	4,187,942	161,075
3 mos.	8,918,958	2,069,738	41,922	11,630,766	149,112
April	2,575,788	573,381	12,356	3,333,535	128,213
May	2,060,896	425,099	6,648	2,628,261	97,343
June	1,637,660	310,070	2,622	2,056,466	82,259
July	1,525,912	241,880	5,162	1,869,416	71,901
Aug.	2,042,820	361,781	5,759	2,541,501	97,750
Sept.	2,252,976	409,922	6,844	2,814,996	108,269
Oct.	2,505,403	438,468	7,030	3,111,452	115,239
Nov.	2,479,147	459,349	8,397	3,107,226	124,289
Dec.	2,810,404	546,506	11,641	3,551,825	136,609
Total	28,809,964	5,836,194	108,381	36,645,444	117,453

Steel Corporation in Youngstown District Is Reduced

YOUNGSTOWN, April 14.—The record from week to week of iron and steel property operations in the Youngstown district indicates the maintenance of fair to normal output. Production as a whole is placed at an 80 per cent average in the district, running perhaps as low as 70 per cent with the independents and up to 90 per cent with the subsidiaries of the Steel Corporation. In the Shenango Valley there has been a somewhat sharp curtailment by Steel Corporation plants this week. The American Sheet & Tin Plate Co. has reduced the number of its active sheet mills from 10 to 4, while the Carnegie Steel Co. has curtailed steel ingot output at its Farrell, Pa., works.

Banking of a blast furnace at New Castle, Pa., by the Carnegie company reduces the district active total to 31 of 45. Of the idle stacks, however, at least two obsolete units will likely never be operated again, plans having been developed for their dismantling. The banking of Claire blast furnace at Sharpsville, Pa., has been deferred.

Of the 52 independent open-hearth furnaces in the Youngstown district 37 are active; independent Bessemer plant operations are not above 60 per cent. The Steel Corporation is operating 20 of 30 open hearths in this district and its Bessemer departments at 75 to 80 per cent.

Sheet mill schedules indicate weakness this week, with 86 units scheduled of 127, compared with 90 the preceding week. The smaller interests as a rule are operating their sheet mills on a relatively larger scale than the larger, fully integrated makers. The Newton Steel Co., for instance, is continuing 16 hot mills in action of 20, against 17 being operated by the Youngstown Sheet & Tube Co. and 8 by the Republic Iron & Steel So. The Falcon Steel Co. and Mahoning Valley Steel Co. are both operating their full complements of 8 mills each.

Decrease in Steel Corporation's Unfilled Orders

Unfilled orders on the books of the United States Steel Corporation as of March 31 aggregated 4,863,564 tons—a decrease of 421,207 tons from those which remained unfilled on Feb. 28. This is the first decrease since last July and compares with an increase in February of 247,448 tons. A year ago the unfilled business was 4,782,807 tons, or 80,757 tons less than for March 31, this year. Following is the unfilled tonnage as reported by months beginning with January, 1923:

	1925	1924	1923
Jan. 31	5,037,323	4,798,429	6,910,776
Feb. 28	5,284,771	4,912,901	7,283,989
March 31	4,863,564	4,782,807	7,403,332
April 30	.....	4,208,447	7,288,509
May 31	.....	3,628,089	6,981,351
June 30	.....	3,262,505	6,386,261
July 31	.....	3,187,072	5,910,763
Aug. 31	.....	3,289,577	5,414,663
Sept. 30	.....	3,473,780	5,035,750
Oct. 31	.....	3,525,270	4,672,825
Nov. 30	.....	4,031,969	4,368,584
Dec. 31	.....	4,816,676	4,445,339

The high record in unfilled orders was 12,180,000 at the close of April, 1917.

Wire Works at New Jersey Destroyed

The wire and nail works of Igoe Brothers, Avenue A and Poinier Street, Newark, N. J., was destroyed by fire on the night of April 9. Total loss is estimated at $1,000,000. Nine buildings of the 18-acre plant were razed and three others were threatened. The machine shop of Holmes & Rice, occupying a leased building at the plant, devoted primarily to production of screw machine products, also was partially destroyed. This loss was estimated at $100,000 and plans to rebuild are being considered.

The origin of the fire was traced to the tinning room and the conflagration, at first slow, seemed under control, when flames reached a quantity of powdered tin which instantly blazed up, turning the building into a furnace.

Peter Igoe, one of the five brothers operating the works, said that while the manufacturing capacity of the company was crippled, it will be possible to continue the jobbing business at the normal pace, because the company carries large stocks in its Brooklyn warehouse. It also will be in a position to fulfill some of its manufacturing contracts, especially in wire products, by reason of these stocks.

Although no definite plans have been laid, Mr. Igoe said that there is an abundance of building space for the company to rebuild on as large a scale as it deems feasible. Construction will begin at the soonest convenient time.

Agricultural Machinery Manufacturers in Ohio Busy

Agricultural machinery manufacturers in Ohio report that they are operating on a heavy schedule to fill present orders. The American Seeding Machine Co., Springfield, Ohio, is running at capacity to turn out the orders that have been received from rural districts.

The Springfield plant of the American Radiator Co. is operating at about 90 per cent of its capacity. Manufacturers of steel wheels report that their sales have been good.

Foundries are considerably below normal production in Cincinnati territory. Little improvement is expected in the immediate future.

LUXEMBURG MARKING TIME

Large Plants, Well Booked, Are Trying to Maintain Prices—Pig Iron Firm

LUXEMBURG, March 27.—Taken as a whole, the iron and steel market has hardly moved on since the beginning of the year and, generally speaking, the situation has been distinctly unfavorable during February. The bigger plants, sufficiently well booked, had tried to keep quotations nominal, but the competition of the smaller firms, which accepted unduly low prices, disorganized the market and gave a stimulus to the pressure of buyers. The weakness of the London market turned the trend of our own market toward decrease and made transactions rare. Rates have sagged further, affecting more particularly finished products, while pig iron showed resistance.

Under these circumstances the Luxemburg works have been obliged to maintain their production figures at a high level so as to diminish unit costs which, in many cases, are above the selling prices. The Société des Hauts Fourneaux de Differdange has increased, by one unit, the number of furnaces in blast.

As concerns export, the German market is nearly closed by prohibitive taxes affecting metallurgical products entering Germany. Northern American and Southern American markets remain relatively satisfactory, but the Indies and the extreme East, by reason of the financial crisis that persists in Japan, have abstained from buying.

During the last fortnight the situation of the Belgian market bettered slightly, and at present the Luxemburg works are affected by it. This slight pick-up has not developed further and the market just marks time. Works being well booked, quotations received have a tendency to a small rise. For pig iron, firmness predominates; prices for cast iron are 355 to 360 fr. ($18.43 to $18.68 per gross ton); 20 fr. less for basic iron. For finished semi-products quotations from Luxemburg are higher than for Belgium at: Blooms, 480 fr. ($24.90); billets, 500 fr. ($25.95); and largets, 520 fr. ($27). The same is to be said as concerns steel: f.o.b. Antwerp, beams are at £5 8s. to £5 11s. (1.15c. to 1.18c. per lb.); bars, £5 15s. (1.23c.); wire products, £6 16s. 6d. (1.46c.); rods, £6 17s. 6d. to £7 2s. 6d. (1.47c. to 1.52c.). Heavy sheets are firmer at £7 (1.49c.), f.o.b. Antwerp, and medium sheets are well supported at £7 12s. 6d. (1.63c.).

FRENCH MARKET QUIET

Producer Ententes Being Formed Rapidly—Prices Firm on Most Products

PARIS, FRANCE, April 4.—The situation continues far from promising. It had been hoped that the budget might be passed with the greater part of the amendments of the Senate but recent developments leave little hope for such action and the improvement in business expected to follow the Easter holidays does not seem to be materializing.

Negotiations have been entered into again by the French and German iron and steel industries, and French metallurgists are exhibiting considerable interest in these conversations, for German competition has become quite active. Export business is quiet and the constant fluctuations in sterling are adding to the difficulty of doing business.

Coke.—During the month of March the ORCA received from the Ruhr 357,804 tons, about 11,800 tons daily. Although there has been no official statement it is said that the price of indemnity coke will be set at 145.70 fr. retroactive to April 1. This represents an increase of 1.55 fr. per ton, bringing the price to a level with French metallurgical coke, the latter being higher in consequence of the rise in freight rates since March 16.

Pig Iron.—Pig iron production for February shows a decrease in the total as a result of the short month, although the daily rate of production increased. The market continues firm with No. 3 phosphorus pig iron for castings at 345 fr. and certain producers, well booked, not accepting less than 350 fr. per ton f.o.b. furnace. It seems certain that activity in April will be less than the March rate. For export, at least in Antwerp, prices are firm; but in Italy, domestic pig iron is cheaper than foreign. Luxemburg and Belgian furnaces quote 74s. to 75s. f.o.b. Antwerp. Hematite consumption is lighter as a result of the present price level and fairly strong competition. Quotations vary from 410 fr. to 430 fr. per ton at furnace, and one offer from the central region was 450 fr. delivered.

Ferroalloys.—Insufficient water at the hydro-electric works has caused a decline in production and transactions are limited, as a rule, to ferrosilicon 10 to 12 per cent and 25 per cent. Other ferroalloys are extremely quiet.

Semi-Finished Products.—The daily average production of steel for February exceeded the January rate. The domestic schedule of prices continues unchanged. For export, prices are firmer with a slight tendency to rise, especially for Luxemburg material, and the supply is limited. Quotations f.o.b. Antwerp are as follows: Blooms, £5 2s. 6d. to £5 3s.; billets, £5 5s. to £5 6s.; slabs, £5 8s. to £5 8s. 6d.

Rolled Products.—Buyers are covering only for immediate needs. Prices for domestic consumers are unaltered. Beams are moving slowly despite the advent of spring and a fair movement of bars. Deliveries are generally from four to eight weeks. Export demand is not particularly active; Luxemburg and Lorraine producers seem to be slightly better situated than Belgian. Quotations are as follows: Beams, £5 8s. 6d. to £5 11s. 6d.; merchant bars, £5 14s. 6d. to £5 15s. Discussions of a possible agreement or "entente" on rails do not seem to have come to any result. The present difficulties of rail mills seem to be the outcome of overproduction and revival of German competition. The Acieries de Longwy recently quoted the State Railways on 3000 tons of standard rails, 46 kg. sections, 454.75 fr. per ton, $23.10, f.o.b. Longwy.

Sheets.—The producers' entente has been concluded, but there seems to be no generally accepted base price for domestic sales. The entente takes the price of heavy sheets, f.o.b. Antwerp, adds to this the freight rate to the Franco-Belgian frontier or to the ports of Nantes, Bordeaux or Marseilles, plus custom duties and other charges and decreases the total obtained by a few francs. This is the price to the frontier by land or water. For domestic consumers the freight rate from the frontier to consumer's works is added. The new schedule is to be applied at once. Apparently the new method of figuring sheet prices increases the quotation on heavy sheets from 64 fr. to 70 fr. per ton and medium sheets from 85 fr. to 90 fr. The Pompey works, a non-member of the entente, quotes 69 fr. for heavy sheets. For export prices on heavy sheets are firmer; some good business has been done with Italy. The minimum price for sheets 5 mm. thick, f.o.b. Antwerp, is £7 with £6 18s. occasionally done. Negotiations are under way for the formation of an entente of hoop and cold rolled steel producers.

Wire Products.—The entente of producers of wire rods will doubtless be concluded shortly. In the meantime the domestic market is calm. Export prices sag in consequence of German competition at £5 15s.

The Standard Slag Co., Youngstown, has completed another plant at Johnstown, Pa., similar to its properties located principally in northeastern Ohio and western Pennsylvania, for the reduction of blast furnace slag. In addition to the customary uses of its product for road and bridge construction and railroad ballast, the company has developed a special agricultural fertilizer, which it is beginning to market intensively.

Plans of New Companies

The Eastern Fence & Wire Works, 8 Ashland Street, Worcester, Mass., recently incorporated, will operate as erector of wire and iron fences and will design and manufacture steel specialties.

The Warner Auto Accessories Co., Benton Harbor, Mich., incorporated with $50,000 capital stock, will manufacture automobile accessories. It is negotiating to get into production as soon as possible. Clarence T. Warner is general manager.

The S. & S. Electric Co., Inc., 4632 Delmar Boulevard, St. Louis, has been organized as consulting engineer and electrical contractor, planning to act in advisory capacity for manufacturers in the matter of plant lay-out. It will also furnish and install electrical equipment. The company expects to manufacture electrical devices in the near future. It has negotiations under way for the manufacture of specialized control apparatus being developed by Douglas Rolf. Materials are needed. H. F. Spoehrer is secretary-treasurer.

The Berill Mfg. Co., care of Joseph L. C. Bell, 919 White Building, Buffalo, has been organized to take over title to various mechanical inventions.

The Harry Heavy Hardware Co., 114 Liberty Street, New York, recently incorporated to establish a general jobbing and manufacturing business in heavy hardware and specialties, plans to erect a warehouse in Jersey City, N. J., to stock this line of products and also for manufacturing hardware specialties, large tie rods, bolts, etc. L. C. Harry, who is president of the company, has been in this field for nearly 20 years.

The Federal Abrasives Co., Birmingham, Ala., recently organized, is now operating two furnaces on aluminous abrasives and one unit on silicon carbide. It also has a crushing and sizing plant in operation. All equipment has been installed. Theodore Swann is president.

The Meeker Arms Co., 207 Lafayette Street, New Haven, Conn., recently incorporated, is manufacturing a modified Springfield rifle. The company also manufactures ammunition and supplies. John H. Meeker is president.

The Kiromac Mfg. Co., Richmond, Ind., has been incorporated with $30,000 capital stock as manufacturer of standard fire doors, elevator safety gates, elevator doors, industrial doors and hardware specialties. Its plant is located at North Seventeenth Street and Pennsylvania Railroad and distribution is handled through 12 selling agencies.

The No-Gear-Shift Transmission Co., Inc., 1111 Fourteenth Street, Washington, recently was incorporated to manufacture as indicated. Plans are unknown. Joseph Arner is president.

The Cameron Tool & Supply Co., which recently acquired the plant at Cameron, W. Va., of Spang & Co. of West Virginia, has been incorporated with $150,000 capital stock. The new company will continue to manufacture drilling equipment for oil, gas and artesian wells, also oil well supplies and hardware, both wholesale and retail. Verne Monroe is president.

The electric hoist manufacturing branch of the Drake Mfg. Co. has been incorporated as a new unit, known as the Drake Electric Hoist Co., Friendship, N. Y. The Drake motohoist and traveling crane are made by the company.

Electric Rainbow Fountains, Inc., has been formed with $125,000 capital stock to take over the business of the Klaiber-Glenk Optical Co., Inc., manufacturing electrical fountains and aquatic electrical displays, 143 East Twenty-third, New York. Operations will be continued along the same lines but on a larger scale. I. W. Glenk is one of the principals.

The Portsmouth Oxygen Corporation, Portsmouth, Va., recently organized to engage in the electrolytic manufacture of oxygen, has a plant under construction which it expects to put in operation about June 1. Material and equipment have been purchased. H. A. Brandt is one of the officials.

The Jefferson Compress Co., incorporated with capital stock of $250,000, will build a compress at Pine Bluff, Ark., for compressing and storing cotton.

The Beeman Tractor Co. has passed through bankruptcy to the New Beeman Tractor Co., Minneapolis, reorganized and incorporated with $100,000 capital stock. It is intended to continue the manufacture of several types of tractors. H. W. Brown and F. E. Gardner are the officials.

The Electrical Necessities Corporation has been organized with $150,000 capital stock to manufacture electrical products. It has leased a factory at Leib and Larned Streets, Detroit, with 12,000 sq. ft. of floor space and now is in operation. This is an outgrowth of the Gem Mfg. Co., Inc., which, was chartered last year with J. L. Webber as president, J. B. Webber, vice-president and Frank M. Eldredge, secretary-treasurer.

The Vulcan Engineering Corporation, Jackson, Mich., recently incorporated, was formed to take over the plant of the Vulcan Engineering Co. Its business will be largely confined to designing and building of special machinery. M. J. Hobin is president.

The Electro-Chemical Pattern & Mfg. Co., organized in March, 1924, with capital of $40,000 in first preferred and 10,000 shares of no-par stock, will succeed the State Pattern & Mfg. Co., 740 Meldrum Avenue, Detroit. For three years the latter company has made metal patterns and core boxes, confining itself to local territory. It is planned now to extend the business to all parts of the country. The company has a completely equipped plant.

The Syracuse Steam Generator, Inc., South Avenue and Grant Place, Syracuse, N. Y., recently incorporated, is engaged in manufacturing high and low pressure commercial boilers. William J. Lewis is treasurer.

Rainbow Light, Inc., is the newly established American branch of a French manufacturer of electric signs and displays. According to A. Katteyn, who will be manager of the New York office, the product will have practically unlimited application, wherever electric lighting is used. The principals expect to establish five or six plants in this country at the chief centers of population. A laboratory has been established at Long Island City, where eventually a factory will be equipped and put into production. Plans will be developed slowly for a time, since E. Bossi, who is owner of the enterprise, is in Europe. Temporary address is in care of J. S. Bernstein, 250 West Fifty-seventh Street, New York.

Trade Changes

The Harnischfeger Corporation, successor to the Pawling & Harnischfeger Co., Milwaukee, has appointed A. M. Lockett & Co., New Orleans, as agent in parts of Louisiana and Mississippi.

The Northern Conveyor & Mfg. Co., Auer Avenue, Milwaukee, builder of portable conveyors, will move to Janesville, Wis., about June 1. J. B. Whitnall, president, said that the company has outgrown its Milwaukee plant, hence it was necessary to erect a large modern factory of about 32,000 sq. ft.

The George A. Hebb Spring Works, Murray and Austin Streets, Newark, N. J., has moved to 126-128 South Street, Newark.

The Strong, Carlisle & Hammond Co., 1392 West Third Street, Cleveland, has been appointed agent for the sale of Oilgear pumps, variable speed transmissions, hydraulic presses and broaching machines, made by the Oilgear Co., Milwaukee.

The Industrial Supply Co., 345 East Third Street, Los Angeles, Cal., formerly the R. M. Hartwell Co., 329 East Second Street, has recently taken on several new industrial supply lines, and has established headquarters in its new building. The one formerly occupied on Second Street will be used as a branch warehouse. E. M. Buckius has been elected president and treasurer of the company to succeed Robert M. Hartwell. H. L. Horton continues as vice-president and secretary and A. Y. Soule as sales manager.

The American Steel Co., has moved its general offices from the Park Building, Pittsburgh, to its plant at Ellwood City, Pa.

The Service Tool Co., Columbus, Ohio, has been appointed distributor for Central Ohio of Milburn oxy-acetylene welding and cutting apparatus by the Alexander Milburn Co., Baltimore.

The Ingersoll-Rand Co. reports net income for 1924 of $4,454,623, after charges. This compared with $5,971,137 in 1923. Current assets at the close of 1924 were $24,199,622 against current liabilities of $1,758,250. Net working capital remains about the same as for 1923. Operating profits for last year were nearly $2,000,000 less than in 1923. Profit and loss surplus compares with the preceding year as $6,591,798 to $4,212,148.

The Standard Screw Co. in a balance sheet recently issued shows under assets: plant and equipment, $8,366,284; counts receivable of $537,259. Surplus as of Dec. 31, 1924, was $3,054,815.

Machinery Markets and News of the Works

MARKETS CONTINUE QUIET

Machine Tool Demand Has Fallen Off According to Some Reports

Chicago, Apparently the Most Active, Derives Business Mostly from Railroads and Automotive Industry

Although there is considerable machine tool business pending, the universal complaint in the trade is that prospective buyers are slow to close. Some reports say that both orders and inquiries are less numerous than was the case a week or two ago.

Chicago is apparently one of the most active centers, and there the business that is reported comes mainly from the railroads and from the automotive industry. The Pacific Fruit Express is the buyer of 11 tools. The Rock Island Lines have closed for practically all of the machines recently inquired for. The inquiries of the Union Pacific, which are still pending, now total 32 machines.

One of the largest buyers in the automotive field is the Maxwell Motor Co., which has bought considerable equipment for its Newcastle, Ind., plant. The Ford Motor Co. recently bought 20 grinding machines.

New York

NEW YORK, April 14.

THERE is no improvement in machine tool business as a whole, although some lines continue to enjoy a fair volume of orders. Recent sales of turret screw machines have been fairly satisfactory and the same may be said of centerless grinders. There has also been a fair demand for a type of broaching machine with oil feed mechanism. Electrical companies, both those making heavy electrical equipment and the makers of automotive electrical equipment, have been among the most active buyers of machine tools. Railroads continue to buy in a small way. There are indications that the Central Railroad of Georgia has placed orders for a good part of its recent list, which numbered about 20 machines. Several tools have recently been purchased by the Weisbach Co., Gloucester City, N. J., gas mantel manufacturer, which is planning for the manufacture of a household refrigerating device. Among railroad purchases of the week are the following: Erie Railroad, 48-in. car wheel borer; Lehigh & Hudson River Railroad, 48-in. car wheel borer and an engine lathe, 30 in. x 16 ft.; Milwaukee Electric Railway & Light Co., car wheel lathe. The Standard Oil Co. was the buyer of a 48 x 48 in. x 10-ft. planer.

The Endicott Forging & Mfg. Co., Endicott, N. Y., has purchased the following equipment: One Springfield Brandes vertical grinding machine, one 24 x 24 in. x 6-ft. Cincinnati planer, one Becker die sinker, one 16-in. American shaper, one 32-in. Gould & Eberhardt high-duty shaper, one Pels billet shear, one No. 14 Erie press, one No. 12 Erie press, one No. 10 Erie press. S. J. Marshall is president of the company.

H. L. Peel, 50 Church Street, New York, is in the market for a bending roll about 26 ft. long, with drop end housing, having a capacity of 1¼-in. plate.

A marshaling railroad yard will be built at Tondiarpet (near Madras), India, to facilitate sorting freight cars. Makers of yard supplies may communicate with the Home Board for Indian Railways, London, which has charge of all purchases.

Warman & Cook, 209 East Thirty-ninth Street, New York, manufacturers of lighting fixtures, are asking bids on a two-story addition, 18 x 45 ft.

George W. Egbert, Jr., East Forty-first Street, Queens, L. I., operating a cement and concrete block manufacturing plant, has acquired a four-acre tract at Mill Basin, Jamaica, L. I., as a site for a new plant to cost $45,000 with machinery.

The Pulpore Can & Box Co., New York, has leased the forge shop of the Morse Dry Dock & Repair Co., First Avenue and Fifty-eighth Street, Brooklyn, comprising a one-story building, 100 x 175 ft., and will remodel for a new plant.

Nathan Rotholz, 311 Lenox Avenue, New York, architect, has filed plans for a four-story automobile service, repair and garage building, 100 x 125 ft., at 315-23 Sixty-ninth Street, to cost $250,000 with equipment.

The Quality Art Novelty Co., 18 West Eighteenth Street, New York, is considering the purchase of a milling machine.

The Associated Gas & Electric Co., 61 Broadway, New York, operating power properties in New England, Ohio, Kentucky, Tennessee and other States, is disposing of a preferred stock issue of $2,520,000, a portion of the proceeds to be used for expansion in power plants and system. J. I. Mange is president.

Daniel Van Wicklen, Hempstead, L. I., architect, has completed plans for a two-story service, repair and garage building at Mineola, L. I., 25 x 65 ft., to cost $40,000.

The Jamaica Water Supply Co., Jamaica, L. I., is planning for the installation of pumping machinery and accessory equipment at its plants, including electric power apparatus. Construction is under way on two new electric stations in which equipment will soon be installed. The company is arranging a preferred stock issue to carry out the work.

The American Chamber of Commerce in France, 32 Rue Taitbout, Paris, has received an inquiry (No. 17-3013) from a local company desiring to get in touch with American manufacturers of automobile and bicycle equipment and accessories.

The Clyde Valley Co., Falls of Clyde, near Glasgow, Scotland, has secured permission from the Government to construct and operate two hydroelectric power plants at Cora Linn and at Stonybyres Falls respectively. Plans will be drawn in the near future. Edward B. Cipriani, American Vice-Consul, Glasgow, has information regarding the project.

A one-story steam power house will be constructed by the C. N. West Disinfecting Co., Long Island City, at its proposed five-story and basement plant estimated to cost $300,000 with equipment. Contract has been let to the White Construction Co., 95 Madison Avenue, New York.

Richard J. Cullinan, 49 Sterling Place, Brooklyn, architect, will erect a two-story automobile service, garage and repair building, 75 x 100 ft., at 547-551 West 133d Street, New York, to cost $70,000 with equipment.

The Common Council, South Amboy, N. J., is considering the electrification of the municipal water plant, replacing all present steam-operated equipment.

Fire, April 9, destroyed a portion of the grain elevators of Meyer & De Vogel, Summer and Franklin Streets, Paterson, N. J., with loss estimated at $100,000 including hoisting, conveying and other equipment. Plans are under advisement for rebuilding.

The Asiatic Petroleum Co., Constable Hook, Bayonne, N. J., has filed plans for additions to its local works, including tanks and auxiliary equipment, to cost approximately $30,000.

The Jersey Central Power & Light Co., Belmar, N. J., will dispose of preferred stock totaling $4,000,000, a portion of the proceeds to be used for extensions in power plants and transmission lines.

The Atlantic Mfg. Co., 50 Nassau Street, Newark, N. J., manufacturer of collapsible metal tubes, etc., has awarded a general contract to Joseph Weisberger, 96 Hunterdon Street, for a one-story plant, 120 x 160 ft., to cost $40,000. Harry M. Veix, 736 Broad Street, is architect. Oscar Scudhelm is president.

The Avon Sheet Metal Co., 361-67 Jelliff Avenue, Newark, has filed plans for a new one-story plant to cost approximately $21,000.

The Pausin Radio Co., 727 Frelinghuysen Avenue, Newark, manufacturer of radio equipment, has plans for a three-story addition to cost about $215,000 with machinery. Edward C. Epple, 9 Clinton Street, is architect and engineer.

The Wrought Iron Novelty Corporation, 147-49 Cator Avenue, Jersey City, N. J., incorporated with $75,000 capital stock, will manufacture wrought iron specialties. It has leased a plant and is in the market for equipment and materials.

The Wickes Machinery Co., Jersey City, N. J., is in the market for a turbo set, 200 or 250 kw., 250 volts, for operation on 125-lb. steam pressure.

Philadelphia

PHILADELPHIA, April 13.

CONTRACT has been awarded by the Electric Storage Battery Co., Nineteenth and Allegheny Streets, Philadelphia, to the William Steele & Sons Co., 219 North Broad Street, for an addition, 80 x 245 ft., to cost $78,000.

The American Oil Co., American Building, Philadelphia, will make extensions and improvements in its oil storage and distributing plant at Amsbury and Fairhill Streets, including the installation of additional equipment, estimated to cost $30,000. Lewis Blaustein is president, and T. J. O'Connell, company engineer.

The Philadelphia Roll & Machine Co., Philadelphia, has sold its plant at Washington Avenue and Twenty-third Street, 374 x 400 ft., including foundries and machine shops, to E. M. Harris, Philadelphia, for $172,000. No announcement has as yet been made by the new owner regarding occupancy.

The Board of Education, Eighteenth and Ludlow Streets, Philadelphia, is considering the installation of a manual training department in a proposed three-story senior high school at Seventeenth and Pike Streets, estimated to cost $1,000,000. I. T. Catherine is architect for the board.

Leon Kelvin, 5416 Vine Street, Philadelphia, has filed plans for a two-story machine and repair shop at Poplar Street and Meeting House Lane.

The Reading Railroad Co., Philadelphia, is taking bids on a general contract until April 18 for the erection of its proposed grain elevator and dock on the waterfront, estimated to cost $3,000,000. Hoisting and conveying machinery, electric power equipment and dock-handling machinery will be installed. A. T. Dice is president.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: (43421) from the Nyal Drug Store, P. O. Box 206, Scarborough, Tobago, British West Indies, in the market for oil engines and sugar mill machinery for the production of refined sugar from sugar cane; (43409) from M. D. Kapur & Co., 33 Rama Cloth Market, Amritsar, India, desiring to get in touch with American manufacturers of brass tubing, shoe machinery, metal window frames, bookbinders' machinery, textile knitting machinery, and kindred equipment; (43428) from Compania Perforadora e Importadora de Maquinaria Agricola, S. A., P. O. Box No. 29, Mexico City, Mexico, desiring to get in touch with American manufacturers of machinery for the production of fluted paper cups; (43415) from Rassih Zade Freres, P. O. Box No. 93, Adana, Turkey, wishing to get in contact with American manufacturers of pumps, pipe, and fittings, catalogs are requested to eliminate loss of time, with prices c.i.f. Messina, correspondence in French; (43398) from Anton E. Neilson, Heklas Alle 11, Copenhagen S., Denmark, desiring to get in touch with American manufacturers of oil pumps, toolmakers' specialties, bookbinders' machinery, lubricators, vulcanized fiber, etc.; (43423) from Seymour-Sheidon Co., Ltd., Coventry House, London, E. C. 2, England, desiring to get in touch with American manufacturers of carpenters' tools, saws, chisels, etc., agricultural machinery, fencing wire, box strapping, galvanized wire, wire netting, barbed wire, tinned and plated forks, knives, etc. C. M. Avis, managing director of the company, will be in New York in May, and will make appointments to interview manufacturers. He can be addressed care of the Philadelphia Commercial Museum, mail to be held pending arrival.

The Ford Motor Co., Highland Park, Detroit, has taken title to the plant of the Merchant Shipbuilding Co., Chester, Pa., formerly known as the Roach Shipyard, with water-frontage of about 2200 ft. on the Delaware River. The new owner will arrange for an automobile assembly plant at this location, remodeling existing structures and erecting new buildings, reported to cost close to $1,000,000 with machinery.

Lester Davis, 616 Spruce Street, Scranton, Pa., architect, is taking bids on a general contract for a four-story automobile service, garage and repair building on Adams Avenue, 120 x 160 ft., to cost $350,000 with equipment.

The Van Why Auto Body Works, Inc., Stroudsburg, Pa., manufacturer of commercial automobile bodies, including bus bodies, has acquired property at Pembroke, Pa., and will erect a new plant to provide increase in present output. It is proposed to remove the existing Stroudsburg works to the new location.

Fire, April 8, destroyed a portion of the plant of the Lebanon Drop Forge Co., Avon, near Lebanon, Pa., including forge department, with loss estimated at $75,000 including equipment. Rebuilding plans are under consideration.

The Board of Education, Wehrum, Pa., has awarded a general contract to L. F. Swinter, Trust Building, Ebensburg, Pa., for a two-story and basement manual training school, estimated to cost $75,000. Hersh & Sholler, Commerce Building, Altoona, Pa., are architects.

The Carlisle Tire & Rubber Co., Carlisle, Pa., has plans for an addition to cost $50,000 with machinery. Foundations will be laid immediately. Charles S. Moomy is president.

The Lackawanna Foundry Co., Dickson City, Pa., manufacturer of stoves and stove castings, is considering rebuilding the portion of its plant destroyed by fire April 7 with loss approximating $95,000 including equipment. Adolph Goodman is president and general manager.

The Board of Education, Bloomsburg, Pa., plans the installation of manual training equipment in a proposed high school estimated to cost $150,000, for which bids will be asked at once on a general contract.

The E. B. Leaf Co., Real Estate Trust Building, Philadelphia, is looking for about 3000 ft. of used cyclone fencing, preferably of 8-ft. height.

The Christiana Machine Co., Christiana, Pa., is in the market for molding machines and flasks in good condition for jobbing work. Sizes about 30 x 36 in. and 36 x 48 in.

Chicago

CHICAGO, APRIL 13.

IN a market which is still essentially sluggish, interest is centered on the railroads and the automobile industry. The Pacific Fruit Express has closed for a list of 11 items for its Pocatello, Idaho, shop, which was published in THE IRON AGE of March 12. It is understood that this business went largely to Pacific Coast dealers. The Union Pacific System is now in the market for 32 machines, on which action is expected to be taken late this month or early in May. The Atchison, Topeka & Sante Fe has sent out additional inquiries for four machines. The Rock Island lines have now closed for the nine machines reported in THE IRON AGE of Feb. 26, with the exception of a bending roll.

Union Pacific System

All tools to be motor driven except where otherwise stated

One combination journal turning and axle lathe.
One 6-ft. full universal radial drill.
Two 5-ft. plain radial drills.
One self-contained four-column hydropneumatic press with pneumatic pull-back to table.
One double end punch and shear with 24-in. throat.
One Chambersburg, or equivalent, mounting and demounting wheel press, capacity 250 tons for mounting and 500 tons for demounting.
One 1500-lb. steam drop hammer.
One geared trimming press.
One drill grinder similar to style W. F. J. New Yankee.
One 32-in. extra heavy duty railroad shaper.
One 24-in. lathe, 9 ft. between centers.
One 18-in. lathe, 6 ft. 2 in. between centers.
One Sundstrand radius internal and surface grinder.

The Crane Market

WHILE there is a fair volume of pending business in overhead cranes, purchasing has been light in the past fortnight. The locomotive crane field is quiet although it has recently been enlivened by the purchase of four cranes by the Chile Exploration Co., New York, and an inquiry from the New York Central railroad for six locomotive cranes for lines East and West; four 25-ton and two 20-ton. A fair demand for overhead cranes for export is reported by some sellers and a number of purchases have been made. Among current domestic inquiries that have appeared lately is one from R. D. Wood & Co. for two 10-ton and three 5-ton electric overhead cranes for the Florence, N. J., plant of the company. The Phoenix Utility Co., 71 Broadway, New York, which closed last week for the second 100-ton overhead crane for which it has been in the market for some time, has asked for prices on a 125-ton and 15-ton electric traveling cranes. The Pennsylvania Railroad, Philadelphia, is inquiring for a 15-ton, 97-ft. 10-in. span overhead crane for the car repair shop at Pitcairn, Pa. The General Electric Co., Schenectady, N. Y., which closed last week on a 10-ton crane for Cleveland, has inquiries outstanding for 10-ton cranes for Schenectady and West Philadelphia and is expected to inquire before long, direct from Lynn, Mass., for one or two small cranes. The Brooklyn Edison Co. inquiry for about 12 chain blocks is still pending. Recommendation on the purchase of a 30-ton and 15-ton crane has been made by Gibbs & Hill, New York to the Virginian Railway.

In the Chicago district the Atchison, Topeka & Santa Fe is in the market for a 30-ton electric traveling crane for a tank shop. The Pittsburgh territory has been quiet in the past week. There is a fair volume of inquiry but buyers are slow in awarding business.

Among recent purchases are:

Chile Exploration Co., New York, one 50-ton, one 25-ton, one 10-ton and one 10-ton crawling type locomotive crane for export, from the Industrial Works.

Newport News Shipbuilding Co., Newport News, Va., a 5-ton electric hoist from the Shepard Electric Crane & Hoist Co.

Illinois Central Railroad, Chicago, two 15-ton and one 5-ton electric overhead crane from the Whiting Corporation.

Phoenix Utility Co., 71 Broadway, New York, a 100-ton overhead crane for Trinidad, Tex., from the Whiting Corporation.

Carrier Engineering Corporation, Newark, N. J., a 15-ton, 32-ft. span, 3-motor, overhead crane from the Shepard Electric Crane & Hoist Co.

General Electric Co., Schenectady, N. Y., a 10-ton electric crane for Cleveland from the Cleveland Crane & Engineering Co.

Great Northern Paper Co., Millinocket, Me., a 25-ton hand power crane from an unnamed builder.

Decou & Davis, Baltimore, Md., a 15-ton, 3-motor crane for city of Baltimore, fire department repair shop, reported purchased from the Chesapeake Iron Works.

Standard Oil Co. of New Jersey, 26 Broadway, New York, a 5-ton, 32-ft. 6-in. span hand power crane for export to Sumatra, from Alfred Box & Co.

James McNeil & Brother Co., Pittsburgh, a 10-ton, 46-ft. span, 3-motor crane from the Milwaukee Electric Crane & Mfg. Co.

McKinney Steel Co., Cleveland, seven double-hook special type cranes from the Morgan Engineering Co.

One 28-in. Aurora new model upright drill press.
One 4-gag punch with 36-in. throat to punch 1¼-in. hole in 1-in. material.
One 32-in. crank planing machine.
One 5-ft. plain heavy duty radial drill.
One 24-in. x 6-ft. between centers engine lathe.
Two 18-in. x 8-ft. quick change engine lathes.
One 20-in. x 6-ft. between centers engine lathe.
One 20-in. full universal monitor brass lathe.
One 44-in. heavy duty vertical boring and turning mill.
One 48-in. car wheel boring mill.
One 18-in. crank slotting machine.
One 2-in. pipe machine.
One 1¾-in. Model F Gridley automatic multiple spindle screw machine.
One Niles, or equivalent, 12-ft. blacksmith's full pneumatic flanging clamp.
One Dreis & Krump No. 2C cornice brake.
One Niagara 52-in. foot gap shear.
One National No. 1 die sharpener.

Atchison, Topeka & Santa Fe List

All tools to be motor driven except where otherwise stated.

One belt-driven 1½-in. National, or equivalent, bolt heading machine.
One double dry emery grinding machine with two 24-in. x 3-in. emery wheels.
One Whitney, or equivalent, single wet tool grinder with 20-in. x 2½-in. wheel.
One Landis, or equivalent, heavy duty type double head bolt cutter.

The Maxwell Motor Co. has bought considerable equipment for its Newcastle, Ind., plant, including a large continuous milling machine, two gear tooth rounding machines, six hand screw machines, two oil gear-type broaches and two automatic chucking machines. The A. O. Smith Corporation, Milwaukee, has purchased two 16-in. toolroom lathes. The Remy Electric Co., Anderson, Ind., has placed orders for three automatic chucking machines, and the Delco Light Co., Dayton, Ohio, has closed for two tools of the same type. The Hurley Machine Co., Chicago, has closed for a few tools, including a duplex milling machine and upright drills. Vandercook & Sons, Chicago, have placed an order for 36 x 36-in. x 12-ft. Gray motor-driven planer with speed variator. It is reported that the Southern Railway will purchase tools for its shop at Princeton, Ind.; and a shop on its subsidiary, the Mobile & Ohio, at Murphysboro, Ill. These shops were in the path of the recent tornado.

The Premier Motor Corporation, Indianapolis, is offering for sale a considerable list consisting principally of grinding machines, milling machines, drill cutters and screw machines. This company has abandoned the manufacture of pleasure cars and is concentrating on the production of taxicabs.

The Mack International Motor Truck Corporation, 132 East Twenty-third Street, Chicago, Ill., will construct a two-story sales, service and storage building, 265 x 420 ft., at 3300-3358 Wentworth Avenue, to cost $360,000.

I. O. Oschewitz & Son, 873 Lexington Avenue, Cincinnati, have awarded a contract for a two-story sausage factory, 80 x 80 ft., to cost $100,000.

William C. Shinn, 154 Whiting Street, Chicago, has awarded contract for a one-story lock factory, 75 x 125 ft., at 2024-26 North Racine Avenue, to cost $30,000.

Albertson & Co., Sioux City, Iowa, manufacturers of automobile tools, are erecting an addition to cost $30,000.

The Paramount Textile Machinery Co., Kankakee, Ill., is adding a third-story addition to its plant.

The St. Louis Steel Products Co., Greenville, Ill., manufacturer of steel balls used in grinding cement, has completed another factory building, 40 x 52 ft., to take care of expanding business.

The Marion Machine Foundry & Supply Co., Marion, Ind., has bought from the Swartwout Co., Cleveland, the latter's good will, patents and machinery for the manufacture of Swartwout metal buildings. The equipment for manufacturing the buildings will be shipped to Marion at once, where an addition, 120 x 130 ft., will be built to house the new department.

The Locomobile Co. of Illinois, Inc., Chicago, has plans for a two-story service and repair building with sales department, at 2400 Michigan Avenue, 100 x 160 ft., to cost $150,000 with equipment. M. S. Nelson, 1722 North California Avenue, is architect.

The City Council, Crofton, Neb., is planning for extensions and improvements in the municipal light and power plant, including the installation of an engine, generator and accessory equipment.

The City Council, Waite Park, Minn., is considering the installation of pumping equipment in connection with a proposed municipal waterworks, for which a bond issue has been approved. L. A. Cleall is city clerk.

The Lakeside Ice Co., Omaha, Neb., operating in the Carter Lake section, has tentative plans for rebuilding its plant partially destroyed by fire April 1, with loss estimated at $135,000 including equipment.

The Inland Coal & Dock Co., Fiftieth Avenue, West, Duluth, Minn., has plans for a one-story machine shop, 40 x 76 ft., to cost $28,000. Crecelius & Phillips, Union Trust Building, Cleveland, are architects.

G. B. Ackerman, 1516 North Menard Avenue, Chicago, operating a sheet-metal works, is considering the installation of additional equipment.

John Morrell & Co., Sioux Falls, S. D., meat packers, will proceed with the erection of a six-story refrigerating and cooling plant, 120 x 250 ft., to cost $300,000 with machinery. Henschien & McLaren, 1637 Prairie Avenue, Chicago, are architects.

The Pittsburgh-Des Moines Steel Co., Eleventh and Tuttle Streets, Des Moines, Iowa, manufacturer of tanks, towers, etc., has plans for a one-story addition, 66 x 320 ft., estimated to cost $25,000.

The Waldorf Paper Co., St. Paul, Minn., is arranging a construction program to cost about $750,000, including an initial unit for which plans have been completed, to cost approximately $150,000. Work will begin on this structure immediately.

The State Legislature, North Dakota, has authorized an appropriation of $24,650 to purchase equipment for the power plant at the State university at Grand Forks. Thomas F. Kane is president of the institution.

The Board of Education, Thornton Township, Harvey, Ill., is planning the installation of manual training equipment in a proposed two-story high school addition to cost $350,000, bids for which will be asked in May. Chatten & Hammond, 160 North La Salle Street, Chicago, are architects.

New England

BOSTON, APRIL 13.

FURTHER recession in new machine tool inquiries is noted. Local firms have a sizable list of live prospects, but still report difficulty in closing. Current business is confined to a single tool here and there, largely used machinery. Companies issuing inquiries within a month apparently are no nearer the point of actual purchase than they were a week ago.

Bids close April 17 on a two-story and basement trade school to be erected by the city of Boston in Roxbury, McLaughlin & Burr, 88 Tremont Street, Boston, are the architects.

The Winthrop Mills Co., Winthrop, Me., has awarded contract for a four-story and basement, 64 x 202 ft. addition for which motors and miscellaneous equipment are required. E. P. Sheldon & Son, Hospital Trust Building, Providence, R. I., are the architects.

The Koppers Construction Co., Pittsburgh, has started the installation of new coke ovens for the Lynn Gas & Electric Co., Lynn, Mass. The construction company last week lost several thousand dollars' worth of tools by fire.

Work has begun on a new plant for the Electric Appliance Co., Waterbury, Conn., one-story, 55 x 65 ft., for which a general contract recently was let to Bergen Brothers, Waterbury. Later the company plans another factory on adjoining site. C. Jerome Bailey, Waterbury, is architect.

The Crane Co., 836 South Michigan Avenue, Chicago, has asked bids for a two and three-story factory branch and distributing plant at Columbus Avenue and Cypress Street, Springfield, Mass., 87 x 130 ft., to cost close to $100,000. McClintock & Craig, 33 Lyman Street, Springfield, are architects.

Fire, April 10, destroyed a portion of the plant of the Burdette Chair Co., Keene, N. H., with loss estimated at $80,000, including equipment. Plans for rebuilding are under consideration.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until April 21, for 10,525 lb. copper tubing and 850 lb. copper pipe for the Portsmouth navy yard, schedule 3597; also for 75,000 lb. manganese bronze for the same yard, schedule 3595.

The American Steel & Wire Co., New Haven, Conn., has taken out a permit for improvements and extensions in its steam power house at 237 Fairmount Avenue, including the installation of coal conveyors, new coal bunker and kindred equipment, to cost about $45,000.

The White Marble & Terazzo Co., Lee, Mass., has tentative plans for rebuilding the portion of its plant, including machine shop, recently destroyed by fire, with loss approximating $70,000 including machinery. J. F. Deely is one of the heads of the company.

Fred E. Leland, 292 Main Street, Cambridge, Mass., architect, has completed plans for a three-story automobile service, repair and garage building, 103 x 225 ft., at Kendall Square and Hayward Street, to cost approximately $175,000.

Fire, April 2, destroyed a portion of the plant of the Xcluso Auto Truck Co., Bethel, Conn., with loss estimated at $50,000, including equipment. Plans are under advisement for rebuilding.

John H. O'Neil, Lowell, Mass., operating a sheet metal works, has removed his plant from 118 Gorham Street to 314 Middlesex Street, where facilities will be provided for increased production.

The business of the Hudson Belting Co., Worcester, Mass., manufacturer of leather belting, has been purchased by a group of business and banking men, mostly of Bridgeport, Conn., and a complete reorganization has been effected in personnel and in capitalization, with the purpose of conducting the business on a larger scale. Frederick M. Hudson, president and treasurer and principal owner, retires. The new officers are as follows: President, John W. Grant, Bridgeport, formerly vice-president and general manager M. Palmer Belting Co. of that city; treasurer and clerk, Robert N. Blakeslee, Jr., Bridgeport; first vice-president, Robert N. Blakeslee, Sr., formerly publisher of the Bridgeport *Post;* second vice-president, Thomas T. Pond, Boston. Directors are the above officers and Charles E. Hough, president City National Bank, Bridgeport; Francis H. Dewey, Jr., Worcester, and Sherman L. Whipple, Jr., of the Chilton Co., Webster, Mass. The capital has been largely increased to $200,000 in preferred stock and 3000 common shares, no par value. The business of the Hudson Belting Co. was established in 1854.

The Brink & Cotton Mfg. Co., Bridgeport, Conn., organized with $50,000 capital stock, will install equipment at 1862 State Street, where it will manufacture hardware, automobile accessories and light products. Fred Brink is one of the officials.

Pittsburgh

PITTSBURGH, APRIL 13.

BUSINESS in machine tools in this district is largely prospective. Dealers and manufacturers' representatives have good lists against which quotations have been made, but buyers are moving with extreme caution in closing. The list of the Westinghouse Electric & Mfg. Co. for second quarter requirements has not yet appeared, but is expected this week. Some refiguring of quotations will be necessary on motor-driven tools, due to the fact that leading makers of motors have lately lowered their prices. The reduction is greatest, however, in motors of small horsepower. Most manufacturers last year kept their small motor departments in operation when the demand favored a suspension; this probably explains a greater cut in prices than in the larger motors.

I. J. Pizar, Mercer, Pa., is in the market for a drill press, small lathe, cylinder reboring machine and other equipment for a garage and service station under construction.

The Lewis Mfg. Co., Sharon, Pa., manufacturer of a patented automobile ventilator, has work under way on a one-story plant. Benjamin Lewis is president.

Plans are being arranged by the Allegheny Steel Co., Brackenridge, Pa., for a new one-story foundry, 75 x 96 ft., to cost about $45,000 including equipment.

The Pennsylvania Electric Corporation, Johnstown, Pa., operating the Penn Public System with steam and hydroelectric generating plants and transmission lines, is disposing of a bond issue of $2,500,000, a portion of the proceeds to be used for extensions and improvements. Work during the year will include the completion of a hydroelectric power plant with capacity of 24,000 hp., now under way.

The Galena Signal Oil Co., Franklin, Pa., has acquired the local plant of the Sibley Soap Co., and will remodel for the production of refined oils, greases, etc. The work is estimated to cost approximately $100,000 with machinery.

The New Castle Mining & Clay Products Co., New Castle, Pa., is completing plans for extensions and the installation of machinery for clay mining and manufacture estimated to cost $75,000. It has arranged for an increase in capital from $100,000 to $200,000.

The Board of Education, Lewistown, Pa., is considering the installation of manual training equipment in its proposed two-story junior high school to cost $200,000, for which plans are being prepared by Ritter & Shay, North American Building, Philadelphia.

The Seward Wire Co., Camden Avenue, Parkersburg, W. Va., has awarded contract for a one-story addition to cost $30,000. Additional equipment will be installed. J. O. Seward is president.

The Union Concrete Pipe Co., Ceredo, W. Va., organized as a subsidiary of the Union Sand & Gravel Co., with

THERE is nothing to indicate the fact but the accompanying illustration is a reproduction of a photograph of one of the blast furnaces of the Tata Iron & Steel Co. at Jamshedpur, India, the notable performance of which —1593.5 lb. of carbon per ton of iron produced — was discussed on page 836 of THE IRON AGE of March 19

capital of $200,000, has plans under way for new works to cost $90,000 with machinery. G. W. Sullivan is secretary.

The Whitehill-Gleason Motor Co., Inc., 250 South Euclid Avenue, Pittsburgh, has plans for a three and one-half-story service, repair and sales building, 150 x 250 ft., to cost approximately $100,000 with equipment. M. Nirdlinger, Empire Building, is architect.

Milwaukee

MILWAUKEE, APRIL 13.

ON the basis of a generous increase in the number of inquiries for machine tools, trade prospects are brightening perceptibly. Sales, as yet, are inclined to drag and the sluggishness of the market has been relieved only to a slight extent. The outlook is such that some of the smaller metal-working concerns are making additions to shops or building new plants, and these projects are bringing out an improved call for miscellaneous equipment. Automotive industries are more active buyers, now that production of passenger cars is undergoing a liberal enlargement.

The Kahlenberg Brothers Co., Two Rivers, Wis., manufacturer of marine and farm engines, is breaking ground for a one-story machine shop addition, 85 x 105 ft., which will require considerable equipment. The engineers are Lockwood, Greene & Co., 385 Dearborn Street, Chicago, and the general contractor, Walter W. Oeflein, Inc., 86 Michigan Street, Milwaukee.

The Roberts Brass Co., 181 Lincoln Avenue, Milwaukee, manufacturer of brass goods, has let the general contract to Meredith Brothers, 253 Washington Street, local, for a two-story brick and concrete shop addition, 67 x 106 ft. With new equipment the improvement will cost about $45,000. Robert C. Zannoth is president and general manager.

The Christianson Machine Co., Racine, Wis., occupying leased quarters in the plant of the F. J. Greene Engineering Works, has taken over an area nearly double the present quarters in the former Secor Trunk Co. factory at Third Street and Lake Avenue, and will transfer its operation about May 1. Additions will be made to the equipment. Meanwhile extensive alterations are being made.

The Village Board of Sturtevant, Wis., formerly Corliss, and seat of the principal western production center of the B. F. Sturtevant Co., Hyde Park, Boston, has been authorized to issue bonds for $30,000 for constructing and equipping a municipal water supply system, with artesian well, pumping plant, steel tank and tower and other equipment. Specifications are being prepared by W. F. Reichardt, consulting engineer, Watertown, Wis.

The Swift Products Co., Racine, Wis., has been formed to manufacture a hoisting unit for automobile factories and garages to supplant repair pits. The motive power is derived from the rear wheels of the vehicle and manual drive also is provided. Factory space has been leased in the former Secor Trunk Co. plant at Third Street and Lake Avenue and equipment is being ordered. Operations will begin about May 1.

The Prentiss-Wabers Products Co., Wisconsin Rapids, Wis., manufacturer of auto camp cook stoves and other metal specialties, will build a new factory costing about $50,000. Plans are being drawn by Frank J. Henry, local architect, for a two-story building, 50 x 250 ft., designed for an output of 6700 camp stoves per month, besides large quantities of metal tables, ovens and other accessories. Construction will start this month.

The Milwaukee Flush Valve Co., 121 Reservoir Avenue, Milwaukee, has let the general contract to John L. Stanage, 3526 Cedar Street, for a two-story addition, 40 x 45 ft., and is in the market for some miscellaneous equipment. Julius S. Judell is secretary and general manager.

The Johnson Creek, Wis., Board of Education has engaged Van Ryn & DeGelleke, architects, 114 Grand Avenue, Milwaukee, to design a $75,000 addition to the high school, including a gymnasium, manual training shops and classrooms. Otto Auer is clerk of the board.

The National Vacuum Street Sweeper Co., Jefferson, Wis., incorporated some time ago to manufacture municipal equipment, has been granted permission to dispose of $1,000,000 of its authorized capital stock. Meanwhile equipment of a factory is proceeding at Jefferson and production will begin about June 1. A. C. Deweese is president and chief engineer.

The Kerner Incinerator Co., 1028 Chestnut Street, Milwaukee, manufacturer of garbage and waste reduction units for homes, hospitals, hotels, etc., has let the general contract to Klug & Smith, consulting engineers, 65 Wisconsin Street, local, for a new plant, two stories, 70 x 120 ft., at 641-643 East Water Street. Purchases of equipment will be made about May 1. Mackey Wells is president and general manager.

The LaCrosse, Wis., Common Council is considering the proposition of electrifying the municipal pumping plant to effect an estimated annual saving of $7,000 to $8,000 by purchasing central station current. The present steam pumping equipment is to be retained as a reserve and auxiliary supply. C. C. Congdon is city engineer.

The French Battery & Carbon Co., Madison, Wis., manufacturer of dry cell batteries, flashlights, etc., has disposed of a $750,000 bond issue, the proceeds of which will be used for plant extensions and the acquisition of more equipment. The added facilities will largely benefit the battery division, which is overcrowded with orders for radio supplies.

Buffalo

BUFFALO, April 13.

BIDS are being asked by the City Council, Niagara Falls, N. Y., for a one-story municipal machine shop and garage, 70 x 200 ft., to cost $50,000 with equipment. E. B. Moss, City Hall, is engineer.

The Marine Elevator Co., Chamber of Commerce Building, Buffalo, is disposing of a bond issue of $900,000, the proceeds to be used in connection with a new steel and concrete grain elevator on the Buffalo River, with hoisting, conveying, loading and other machinery. It will have a capacity of 2,000,000 bu. and is expected to be ready for service in November. Harold L. Abell is president.

The American Laundry Machinery Co., Buffalo Road, Rochester, N. Y., has tentative plans for a new three-story building, 130 x 150 ft., adjoining its present works.

Traveling cranes, hoisting machinery, conveying and other equipment will be installed in the new freight shipping and passenger terminal to be erected by the Cleveland & Buffalo Transit Co., 16 Eagle Street, Buffalo, at the foot of Erie Street, to cost $1,000,000. William S. Lougee, Marshall Building, Cleveland, is architect. George A. Bomm is general manager.

The Niagara, Lockport & Ontario Power Co., Lafayette Building, Buffalo, is completing plans for taking over and consolidating the Livingston-Niagara Power Co., Cambria Power Co., Western New York Electric Co. and the Bryant Power Co., Inc., operating at Jamestown, N. Y., and vicinity. Plans are under way for extensions and betterments, including additional equipment installation.

Wheaton Brothers, 380 Broad Street, Waverly, N. Y., have plans under way for a one and two-story automobile service, repair and garage building, 100 x 100 ft., to cost $85,000 with equipment. Claude Smith, Broad Street, is architect.

Homer Strong & Co., Inc., 301-7 State Street, Rochester, N. Y., is in the market for a 36 or 42 in. wide Ingersoll mill, with 10- to 12-in. bed and four heads.

A. M. Anderson, purchasing agent, North East Electric Co., Rochester, will buy Nos. 121, 216 and 217 single spindle, used Baker drilling machines.

The recently reorganized Covert Gear & Mfg. Co., Lockport, N. Y., will invest $400,000 as working capital in continuing the operation of the plant, according to an announcement by officials. The new firm has taken over the plant, equipment and property of the old Covert Gear Co., defunct, and for the present will specialize in the manufacture of automobile parts. Later it is planned to manufacture another product, the nature of which has not been disclosed.

The Weaver Garage Co., Tyrone, N. Y., is in the market for a lathe, drill press and other electrically operated equipment, to replace that recently destroyed by fire.

The W. R. Case & Sons Cutlery Co., Little Valley, N. Y., manufacturer of jack-knives, has plans for a one-story brick and steel factory, to cost $25,000 exclusive of equipment, which will be electrically operated.

A general contract has been awarded to Charles Haas, Twelfth and Monroe Streets, by the Jamestown Car Parts Mfg. Co., Allen Street Extension, Jamestown, N. Y., manufacturer of automobile radiators, metal furniture, etc., for a one-story brick addition, to cost $50,000 with equipment. Gustave Lawson is secretary.

Detroit

DETROIT, April 13.

CONTRACT has been let by the Metal Office Furniture Co., 1491 South Division Avenue, Grand Rapids, Mich., to J. McNabb & Sons, Murray Building, for a two-story addition to cost $50,000.

The Consumers Power Co., Jackson, Mich., is arranging for enlargements in its steam power plant at Saginaw, Mich., with the installation of boilers and other equipment estimated to cost $150,000.

The Root Spring Scraper Co., 527 West Ninth Street, Kalamazoo, Mich., will rebuild the portion of its plant recently destroyed by fire. An official estimate of loss has not been announced.

The Grover Co., 428 East Jefferson Avenue, Detroit, manufacturer of cash carriers and kindred specialties, will begin work on a one-story addition, 30 x 110 ft. Halpin & Jewell, Hammond Building, are architects.

The Thompson Cabinet Co., Ludington, Mich., has plans for improvements to cost about $25,000. Additional equipment will be installed. T. A. Thompson is head.

The Board of Education, Newaygo, Mich., plans the installation of manual training equipment in its two-story high and grade school, estimated to cost $165,000, for which bids will be asked on general contract this month. H. H. Turner and V. E. Thebaud, Michigan Trust Building, Grand Rapids, Mich., are architects.

The Grand Haven Brass Foundry, Grand Haven, Mich., has negotiations under way with the Kelly Valve Co., Muskegon, Mich., to take over its valve production, and when arrangements are consummated all manufacture will be carried out at the Grand Haven plant. Plans are under way for a one-story addition, as well as the transfer of considerable equipment from the Muskegon works.

Koehler Brothers, Saginaw, Mich., manufacturers of ornamental iron products, will take bids at once for a two-story addition, to cost approximately $25,000.

The Board of Education, Marquette, Mich., is considering the installation of manual training equipment in its proposed three-story high school estimated to cost $500,000, for which it is purposed to ask bids on a general contract in June. John L. Chubb, 109 North Dearborn Street, Chicago, is architect.

The Central Castings Co., Owosso, Mich., founded a year ago, will double its capacity by constructing an addition, 25 x 60 ft., and adding a 48-in. cupola.

Cincinnati

CINCINNATI, April 13.

SALES have decreased in the local machine tool market the past week. The number of inquiries out is fairly good, but orders are scarce. Builders of heavy machinery have not suffered from the decline in buying as much as manufacturers of lighter equipment. Production is slowing down. Railroads have made several purchases locally, but most of the business from this source is still pending. Purchases by automobile manufacturers have been light.

The demand for planers continues fair. The Cincinnati Planer Co. sold a 36-in. planer to a New England concern and the G. A. Gray Co. disposed of a planer to the General Electric Co. Orders for shapers have been moderate with the market spotty. Several manufacturers state their business has fallen off in the past 10 days. The Cincinnati Shaper Co. received an order the past week from Cuba. The Baltimore & Ohio Railroad Co. is reported to have bought two shapers from a company in this territory. Production of lathes has decreased, due to the absence of new orders to keep manufacturers running on previous schedules. The Maxwell Motor Car Co. purchased two 16-in. tool room lathes for its plant at Newcastle, Ind. Drill manufacturers state that production is still restricted. The New York Central and the Union Pacific placed orders for drills with local houses the past week. Sales of turret lathes have been slow. Electrical tool business is slightly improved, but below normal. Orders for conveying machinery have not been satisfactory. Machinery dealers report that the market has been quiet. The sale during the coming week of more than 900 tools and machines by the Davis Sewing Machine Co., Dayton, Ohio, is having a depressing effect on dealers in this territory. A small number of automatic screw machines and milling machines were sold in the past week. Used machinery is quiet.

The Ridge Cast Products Co., Mineral Ridge, Ohio, is planning the erection of a one-story foundry addition.

The Shartle Machine Co., 359 Dublin Avenue, Columbus, Ohio, has inquiries out for a used saddle tank locomotive, standard gage, 30 to 35-ton capacity.

The L. J. Breed Equipment Co., James Building, Chattanooga, Tenn., has inquiries out for an angle shear.

The Walsh & Weidner Boiler Co., Tannery Flats, Chattanooga, Tenn., has plans for a one-story addition to its machine shop, 60 x 60 ft., to include the installation of additional equipment. Later it will build a one-story addition to its sheet iron and plate shop, 90 x 100 ft. Improvements will be made in other departments. The entire work is estimated to cost $85,000 with equipment.

The Farragut Marble Co., Knoxville, Tenn., recently formed with a capital of $200,000, has acquired 140 acres of marble properties in Knox County, and plans the installation of a quarrying plant and mill, the latter to include cutting, finishing and polishing departments. S. A. Rodger and John M. Brennels, Wood Hill Place, Knoxville, head the company.

The Tennessee Red Cedar & Novelty Co., Chattanooga, Tenn., plans the erection of a new two and one-half story building, 100 x 130 ft., to cost $75,000 with equipment. T. C. Betterton is president.

The Himyar Coal Co., Domino, Ky., has plans under way for remodeling its tipple and the installation of additional equipment.

The Fowler-Lewis Oil Co., 109 East Seventh Street, Chattanooga, Tenn., is completing plans for a new oil-reclaiming plant at St. Elmo, Chattanooga, to cost $45,000 with equipment.

The Southern Material & Construction Co., South Trust Building, Little Rock, Ark., headed by Charles E. Miller, president, has acquired property at Hickman, Ky. Plans are under way for the installation of a sand and gravel mining and handling plant, including conveying, loading and other equipment.

South Atlantic States

BALTIMORE, April 13.

CONTRACT has been let by Masson's Express, 107 West Pratt Street, Baltimore, for a three-story automobile service, repair and garage building for company cars, 90 x 140 ft., to cost approximately $150,000. G. F. Masson is president.

The Fire Board, Baltimore, has awarded a general contract to Decou & Davis, 6 East Mulberry Street, for a two-story machine and repair shop at the Key Highway and Webster Street, to cost $86,000. C. O. Richardson is president of the board.

The Commissioners of the District of Columbia, District Building, Washington, will take bids until April 21 for one air compressor; until April 28 for two motor-driven centrifugal pumping units, 3,000,000 gal. and 1,500,000 gal. capacity in 24 hr., respectively.

Officials of the Georgia Railway & Power Co., Atlanta, Ga., have organized the East Georgia Power Co., a subsidiary, capitalized at $5,000,000, to operate in the vicinity of Augusta and Toccoa, Ga. Initial work will comprise the construction of a steel tower transmission line, about 100 miles, with the installation of automatic power substations and distributing facilities.

The R. S. Armstrong & Brother Co., 676 Marietta Street, Atlanta, Ga., machinery dealer, has inquiries out for a 100-hp. motor, 2200 volts, three-phase, 60 cycles, slip ring type.

The New Bern Cotton Oil & Fertilizer Co., New Bern, N. C., has tentative plans for rebuilding the portion of its plant recently destroyed by fire, with loss estimated at $45,000 including equipment.

The purchasing agent, Post Office Department, Washington, is asking bids until April 23 for one motor-driven saw table, tilting top, with 16-in. rip saw; one air compressor, motor-driven, and one high pressure air reservoir; until April 20 for one measuring pump and underground gasoline storage tank.

The Ford Motor Co., Detroit, is pushing construction on its new assembly plant at Norfolk, Va., and will install equipment for initial employment of about 700.

The City Council, High Point, N. C., will take bids until April 28 for equipment for the municipal waterworks, including four motor-driven and two gasoline engine-driven centrifugal pumping units, with starters and accessory equipment; valves, piping, etc. William C. Olsen, Raleigh, N. C., is consulting engineer. R. L. Pickett is city manager.

The Board of Directors, Massanutten Academy, Woodstock, Va., plans the construction of a central steam power house, to be carried out in connection with other expansion, estimated to cost $300,000. Howard J. Benchoff is president.

The Roanoke Water Works Co., Roanoke, Va., is said to be planning the installation of pumping equipment in connection with proposed extensions and improvements in its waterworks, to cost $50,000. Charles E. Moore is general manager.

The Board of Trustees, University of North Carolina, Chapel Hill, N. C., has plans under consideration for extensions and improvements in its central steam power house and mechanical laundry, estimated to cost $125,000.

The Ourisman-Chevrolet Garage Co., Washington, local representative for the Chevrolet automobile, has awarded a general contract to Edgar Mosher, 1416 K Street, N. W., for a two-story service, repair and garage building, 90 x 145 ft., to cost $67,000 with equipment. H. Warwick, 1400 K Street, N. W., is architect.

The City Council, Bedford, Va., is planning for extensions and improvements in its municipal electric power plant on the James River, estimated to cost $100,000 with equipment.

The Allegany County Board of Education, Cumberland, Md., plans the installation of manual training equipment in its proposed high school estimated to cost $450,000, for which revised plans are being drawn. Smith & May, Calvert Building, Baltimore, are architects.

The general purchasing officer, Panama Canal, Washington, will receive bids until May 4 for one watertube boiler, insulated power cable, four motors, 24 electric drills, galvanized pipe fittings, brass unions, machine screws, wood screws, valves, etc., Panama circular 1663.

The High Point Furniture Co., High Point, N. C., has inquiries out for an air compressor, turning machine, 10-in. molder, straight-line edger and ripping saw, revolving glue clamp, and other wood-working machinery. All machines to be motor-driven.

The Board of Education, Leesburg, Va., will soon break ground for a new high school to replace a structure recently destroyed by fire, estimated to cost $250,000. A manual training department will be installed.

The Georgia Marble Co., Tate, Ga., is inquiring for three stone planers, open side, and one large lathe.

Cleveland

CLEVELAND, APRIL 13.

THE volume of machine tool business continues fair. Manufacturers report a good number of scattered orders, mostly for single machines, and a large number of pending inquiries. Dealers are doing a moderate amount of business, largely in single tools. A few small lot purchases were made the past week by Detroit automobile companies for fill-in purposes. While foreign business continues light, it shows a little improvement. Very little inquiry is coming at present from the railroads.

The Sabin Machine & Tool Co., 6536 Carnegie Avenue, Cleveland, is having plans prepared for a three-story machine shop, 45 x 90 ft. H. B. Sabin is president.

The Pipe Machinery Co., 932 East Seventieth Street, Cleveland, has placed contract with the William Dunbar Co. for a one-story addition, 57 x 130 ft.

The Cleveland Trencher Co. has purchased a two-acre site at St. Clair Avenue and 200th Street, on which it will erect a plant. The Austin Co. has the general contract.

The city of Painesville, Ohio, will take bids April 23 for a filtration plant which will require seven motor-driven centrifugal pumps with capacities from 1000 to 3000 gal. per min.

St. Louis

ST. LOUIS, April 13.

THE Breece-White Mfg. Co., Arkansas City, Ark., is contemplating rebuilding the portion of its lumber and woodworking plant recently destroyed by fire, with loss estimated at $400,000 including machinery.

The Board of Education, Ellis, Kan., plans the installation of manual training equipment in a two-story and basement high school, 110 x 140 ft., for which bids are being asked on a general contract. It will cost about $115,000. Robert E. Peden & Co., McLaughlin Building, Kansas City, Mo., are architects.

Bonds have been approved for $115,000 for extensions in the municipal waterworks at Newkirk, Okla., and the City Council will ask bids soon for pumping equipment and accessory apparatus. H. E. Musson & Co., Grain Exchange Building, Oklahoma City, Okla., are engineers.

Fire, April 2, destroyed a portion of the mill of the Choctaw County Oil Co., Fort Smith, Ark., manufacturer of cottonseed oil products, with loss estimated at $100,000 including equipment. Plans for rebuilding are being considered.

The Lee Tire Chain Industries, Jefferson City, Mo., manufacturers of automobile tire chains, etc., are planning for enlargements and the installation of welding apparatus, electroplating equipment and other machinery.

Work will proceed on a two-story and basement manual arts school, 140 x 150 ft., for the Board of Education, Tulsa, Okla., estimated to cost $120,000, with equipment. Leland I. Shumway, New Wright Building, is architect.

The Trenton Gas & Electric Co., Trenton, Mo., plans extensions and improvements in its local electric light and power house and the installation of additional equipment.

The Public Service Co. of Oklahoma, Tulsa, Okla., is disposing of preferred stock for $1,000,000, a portion of the proceeds to be used for extensions in power plants and system.

The Board of Education, Augusta, Kan., has asked bids on a general contract for a two-story and basement manual

arts school, 50 x 76 ft., for which foundations will soon be laid. S. S. Voigt, Bitting Building, Wichita, Kan., is architect.

The Common Council, Vici, Okla., plans the installation of electric-operated deep-well pumping equipment in connection with a proposed municipal waterworks, for which a bond issue is being arranged. The Gantt-Baker Co., 1116 West Main Street, Oklahoma City, Okla., is engineer.

I. P. Crow, 320 South Boulder Street, Tulsa, Okla., is at the head of a project to construct a cement mill in the vicinity of Dawson, Okla., with power house and machine shop, estimated to cost $1,000,000 with machinery.

The Graysonia, Nashville & Ashdown Co., Texarkana, Ark., is said to be planning to rebuild the portion of its locomotive and car repair shops at Nashville, Ark., recently destroyed by fire. An official estimate of loss has not been announced. C. S. Christian is chief engineer.

The City Council, Braman, Okla., is completing plans for the construction of a municipal electric light and power plant. A city waterworks, with pumping machinery, will also be installed.

Gulf States

BIRMINGHAM, April 13.

THE Alabama Power Co., Birmingham, has awarded a general contract to the Dixie Construction Co., Brown-Marx Building, for a one-story building, 55 x 110 ft., to contain a machine shop, electrical repair shop, electric control equipment testing departments, etc., estimated to cost $75,000. The company is disposing of a bond issue of $3,000,000, a portion of the proceeds to be used for extensions. Thomas W. Martin is president.

The Fracer Brick Co., 810 Central Bank Building, Dallas, Tex., has inquiries out for a 50-hp. steam engine with accessory equipment.

The Pecos Cotton Oil Co., Pecos, Tex., organized as a subsidiary of the El Paso Cotton Oil Co., El Paso, Tex., will soon break ground for a mill to cost about $60,000 with machinery. George Holden, superintendent of construction for the parent organization, will act in a similar capacity for the new concern.

The Texas Utilities Co., St. Louis, is arranging an expansion program in power plants and system. To provide funds the company is disposing of a bond issue of $3,000,000. It has taken over the plant and property of the Slaton Power & Light Co., Slaton, Tex., and plans extensions in this district.

The Peavy-Moore Lumber Co., Deweyville, Tex., will rebuild its saw mill and lumber plant recently destroyed by fire with loss approximating $250,000. It is purposed to have the new mill ready for service in about 90 days and machinery orders will be placed at once. Fred L. Burdette, construction engineer, is in charge.

The Bureau of Yards and Docks, Navy Department, Washington, has plans under way for the installation of a water supply system at the naval air station, Pensacola, Fla., including motor-driven pumping machinery, electric apparatus and auxiliary equipment, specification 5054.

The Vernon Electric & Ice Co., Vernon, Tex., will build a new one-story ice-manufacturing plant to cost about $60,000, including equipment.

The Autocyclic Co., Inc., 835 Conti Street, New Orleans, manufacturer of automobile equipment, etc., is planning for the establishment of an Eastern branch plant in the vicinity of New York, Baltimore or Pittsburgh. It will be in the market for the purchase of a machine shop, fully equipped, in any of the districts noted.

The Valley Electric & Ice Co., Mission, Tex., is completing plans for a new electric power house to cost $35,000.

The Ground Brothers Mfg. Co., 1315 First Avenue, St. Petersburg, Fla., will build a new one-story lumber and wood-working plant, 115 x 190 ft., to cost about $75,000, of which approximately $35,000 will be used for the purchase of equipment, including molders, rip saws, cut-off saws, blower system, motors and other electric power apparatus.

A traveling oven, conveying machinery, electric power apparatus and other equipment will be installed in the two-story addition to be erected at the plant of the Campbell Baking Co., Thomas Avenue and Phelps Street, Dallas, Tex., to be 137 x 140 ft., estimated to cost $85,000. Lang & Witchell, Dallas, are architects. E. C. Carlson is general manager.

The Alabama Water Co., Girard, Ala., is said to be planning the installation of pumping machinery in connection with proposed extensions in its local waterworks estimated to cost $75,000.

The San Saba Light & Ice Co., San Saba, Tex., is arranging for the erection of a new cold storage and refrigerating plant at Richland Springs, Tex., to cost about $35,000. F. R. Hall is general manager.

The G. R. Mueller Co., Brown-Marx Building, Birmingham, has inquiries out for a coal crusher, with capacity for handling about 30 tons of material per hr.

The Alamo Iron Works, San Antonio, Tex., manufacturer of machinery and supplies, is contemplating plant improvements, including the erection of a new steel foundry of about 10,000 sq. ft. Following this, a steel structural shop and a fabricating plant for reinforcing materials will be built. Catalog of buildings, cranes and equipment should be addressed to E. A. Holmgreen, treasurer.

The Quanah Cotton Oil Co., Quanah, Tex., is in the market for a modern cross compound condensing Corliss engine of about 750 hp. capacity.

Indiana

INDIANAPOLIS, April 13.

BIDS are being asked by the City Council, Columbia City, Ind., until April 21, for equipment for a municipal electric power plant, including one uniflow-type engine, vertical jet condenser, 750 kva. electric generator, switchboard and accessory equipment. H. W. Jacobsen, 210 East Forty-sixth Street, Chicago, is engineer. E. E. Erdman is city clerk.

The Nickel Plate Railroad, Fort Wayne, Ind., has plans for new local locomotive and car repair shops, including engine house, machine shops, turntable and other structures, to be carried out in connection with a new terminal project estimated to cost $2,500,000. J. K. Connor, Columbia Building, Cleveland is consulting engineer.

The Epworth Coal Co., Newburg, Ind., is contemplating rebuilding the tipple at its properties about one mile from the city, recently destroyed by fire. Mining equipment lost in the same fire will be replaced. Raleigh Humphreys heads the company.

The Indiana Service Corporation, Fort Wayne, Ind., is arranging for additions at its Spy Run plant, including a one-story car repair shop, machine and wood-working shop, 75 x 120 ft., with other buildings, estimated to cost $200,000 with machinery. The company operates a traction system. Robert M. Feustel is president.

The Indianapolis Pump & Tube Co., Greenwood, Ind., manufacturer of tire pumps, steel tubing, etc., has leased a building from the Columbus Foundry Co., Columbus, Ind., for a new branch works, totaling about 30,000 sq. ft. of space. It is said that a portion of production will be given over to heaters for automobiles. About 100 men will be employed. The company will continue the operation of its branch plant at Connersville. Frank Sparks is vice-president and general manager.

The Lehman Mfg. Co., Cannelton, Ind., manufacturer of children's furniture, toys, etc., will begin the erection of a two-story addition, 75 x 355 ft., to cost more than $50,000 with equipment.

Pacific Coast

SAN FRANCISCO, April 8.

CONTRACT has been awarded by the Pacific Motor Car Co., Santa Barbara, Cal., care of A. C. Sanders, McKay Building, architect, to Carl Cicero, 1025 Castillo Street, for a new plant at Serena, consisting of a main assembly works, 200 x 650 ft., and adjoining building, 100 x 250 ft., estimated to cost $360,000 with equipment. It is expected to begin work in May.

The Los Angeles Creamery Co., Los Angeles, is having plans completed for a four-story cold storage and refrigerating plant at 1120 Towne Avenue, 80 x 120 ft., to cost $80,000 with equipment. The Gay Engineering Co., 2650 Santa Fe Avenue, is engineer.

The American-La France Engine Co., 151 New Montgomery Street, San Francisco, is said to be planning the erection of a one-story assembly works, with repair and service departments, to cost $45,000 including equipment.

The Crown-Willamette Paper Co., 248 Battery Street, San Francisco, is reported to be planning the construction of a new mill in the vicinity of Camas, Wash., for the manufacture of paper bags and containers, including power house and machine shop, estimated to cost $750,000 with machinery.

The Methow-Pateros Growers, Inc., Pateros, Wash., will build a new cold storage and refrigerating plant at Wenatcheem, Wash., estimated to cost $65,000 with equipment. It will also proceed with the construction of a

similar plant, three stories, 90 x 200 ft., at Pateros, to cost close to a like amount. Other cold storage plants are projected at Cashmere, Dryden and Monitor, Wash.

The United States Gypsum Co., San Francisco, with headquarters at 205 West Monroe Street, Chicago, has plans under way for a new mill at its properties at Blythe, Cal., to cost $250,000 with machinery. The company also plans for extensions and improvements in its other Pacific Coast plants. C. A. English is Pacific Coast manager.

The Imperial Ice & Delivery Co., Holtville, Cal., will erect a one-story ice-manufacturing plant, 60 x 90 ft., to cost $55,000 with equipment.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has plans for a new automatic power substation on Ocean Avenue to cost $50,000 with equipment.

The Yellowstone Park Transportation Co., Gardiner, Mont., will proceed with the erection of a one-story machine shop to cost $150,000 with machinery.

Canada

TORONTO, April 13.

THE demand for machine tools in this market continues steady, but is mostly for replacement. The automotive industry is the most active purchaser at present, but the railroads are entering the market from time to time for two or three tools. A number of inquiries are out for equipment for waterworks and sewage disposal plants, also for pulp and paper mills.

The Pneumatic Oil Burners, Ltd., Toronto, will start work within the next two weeks on the erection of a plant at Jarvis and Richmond Streets.

The city of London, Ont., has had plans prepared for waterworks extension to cost $100,000.

The Mond Nickel Co., Coniston, Ont., has started work on the erection of a machine shop at Frood, Ont., 23 x 120 ft., also a dry building, 32 x 106 ft. L. G. Ingolsfrud is mechanical engineer.

The Canadian Wood Impregnating Co., Ltd., Milton, Ont., will make alterations and addition to its factory and proposes to spend approximately $125,000 on new equipment.

The Pneu Oil Burner Co., 292 Sherbourne Street, Toronto, is receiving tenders on a factory to cost $30,000, no closing date set. J. Gordon Jack, 232 Armadale Avenue, is architect.

The town of Annapolis Royal, N. S., will spend $10,000 for electric light plant improvements, new dynamos (probably three phase), direct drive from water motors, and other equipment. F. C. Whitman is chairman of the Committee.

Berry Brothers, paint and varnish manufacturers, Walkerville, Ont., will rebuild a factory recently destroyed by fire, to cost $40,000.

Du Pont Company to Make Rust-Resisting Metal

The Du Pont Everdur Co., Wilmington, Del., has been organized to take over manufacture and sale of the metal alloy developed by chemists of E. I. Du Pont de Nemours & Co. and known as Everdur. Previously this was handled by the Du Pont Engineering Co. The metal has been put to considerable use in manufacturing operations requiring corrosion-resistance metals. Everdur, it is said, has a tensile strength above the acid-resistant bronzes, is easily machined, and makes sound castings. It is also claimed that it can be fabricated into practically all forms obtainable from steel, including cold-drawn seamless tubing. The new company will operate as a subsidiary of the Du Pont company.

The W. M. Pattison Supply Co., Cleveland, machinery dealer, has opened a department for the sale of woodworking machinery, in charge of C. T. Sorensen, who has long been associated in the field as a production engineer. The company has taken the agency for Ohio for these companies: S. A. Woods Machine Co., Boston; C. O. Porter Machine Co., Grand Rapids, Mich.; B. M. Root Co., Newark, Pa.; Wysong & Miles, Greensboro, N. C.; G. M. Diehl Machine Works, Wabash, Ind.; Bell Machine Co., Oshkosh, Wis.; Mereen-Johnson Co., Minneapolis; Tannewitz Works, Grand Rapids, Mich., and Maddox Machine Co., Jamestown, N. Y.

STEEL AND INDUSTRIAL STOCKS

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	78⅛	79⅜	Inland Steel	41⅛	42⅛
Allis-Chal. pf. ..	103⅛	104⅝	Int. Har.	103	104⅛
Am. B. S. & Fdy.	93¼	95	Int. Har. pf.....	114¼	114⅝
Am. B. S. & F. pf.	109⅝	110	Lima Loco.	63¼	64
Am. Can	163⅝	168	Nat.-Acme	5	5
Am. Can pf....	117⅝	118⅛	Nat. En. & Stm..	30⅝	31
Am. Car & Fdy..	199⅝	203½	N. Y. Air Brake	45	46⅝
Am. Locomotive.	123½	125⅝	Otis Steel	10	10½
Am. Loco. pf....	119	119	Otis Steel pf....	60	60½
Am. Radiator ..	96	96½	Pressed Steel Car	53¼	55
Am. Steel Fdries.	48¼	49	Pressed Steel pf.	83	83½
Bald. Loco.	111⅝	115⅝	Replogle Steel ..	14	15⅛
Bald. Loco. pf..	109½	111	Republic	44½	47⅝
Beth. Steel	40⅞	41¼	Sloss-Sheffield ..	84½	84½
Beth. Stl. 7% pf.	95	95	Sloss-Sheffield pf.	92¼	92¼
Beth. Stl. 8% pf.	110½	111	Superior Steel ..	23⅛	24
Br. Em. Steel...	2¼	2¼	Transue-Wms. ..	25⅛	25⅝
Br. Em. Stl. 2 pf.	8½	8½	Un. Alloy Steel..	24½	25½
Chic. Pneu. Tool	82¾	88	U. S. Pipe.....	167⅝	175½
Colo. Fuel	33½	35½	U. S. Pipe pf...	104	104
Crucible Steel ..	66	68¼	U. S. Steel.....	114⅛	115⅝
Crucible Stl. pf..	92	93	U. S. Steel pf...	122⅜	123
Deere pf.	91½	91⅝	Vanadium Steel..	26½	27
Gen. Electric ..	259	272½	W'house Air Br.	97	99
Gt. No. Ore Cert.	28¼	29½	Y'gstown S. & T.	65⅛	66⅝
Gulf States Steel	70	71			

Large Shipments of Acme Steel Co.

The Acme Steel Co., until recently known as the Acme Steel Goods Co., Chicago, had the largest single month's shipment for March of any month in its more than 45 years' history. The shipments during the first quarter of this year were also the largest for any quarter. At a meeting of the board of directors of the company, held April 6, distribution of new $25 par shares of common stock at the rate of three shares to one of the present outstanding common stock was ordered. The directors announced their intention for the present of continuing the same amount of dividend as now being paid, which will be $2 per year on each share of the new stock, although the profits of the first quarter were sufficient to take care of the entire year's dividends. The company is now building a large additional rolling mill which will more than double the tonnage output and expects to be able to pay for it without any additional finances. Incoming orders are being received at about the same rate as shipments, and the company has on hand at present a large unfilled tonnage. It therefore expects continued steady business for the next few months, but no decided boom.

A New Non-Corrosive Metal

A new metal to be known as Imita-Gold, which will resist corrosion from acids, alkalies and sea water, according to the manufacturer, has been placed on the market. The metal is said to possess the hue and lustre of gold and the tensile strength of high carbon steel. Title to the manufacturing rights of the metal in the United States, Canada and Mexico are held by the Imita-Gold Corporation, West Haven, Conn. The corporation recently was formed with authorized capitalization of $50,000. It has a fully equipped foundry and will also manufacture Imita-Gold bearing bronze and a nickel silver called Imita-Silver.

An interesting claim for the process is that it produces a metal whereby copper and aluminum can be combined into a homogeneous alloy without pores or blow holes. Imita-Gold induces a natural lubricant into the metal, according to the patentee, and a bearing may be run dry at intervals without undue heating.

The corporation expects to market this metal in the form of sheets, tubes, rods and wire. Hugo Youngstrand is president.

Sitts, Hicks & Co., 208 South LaSalle Street, Chicago, recently organized, will act as direct mill representatives and jobbers of iron, steel, non-ferrous metals and machinery. Lewis S. Sitts is president, and T. C. Hicks, secretary and treasurer.

The General Motors Corporation will soon begin the removal of its research laboratories from Dayton, Ohio, to Detroit, where they will be housed in the General Motors Building. This results from a desire to concentrate research work in the most convenient location for company officials. Provision for housing the laboratories was made at the time that the General Motors Building was erected. Charles F. Kettering is general manager of laboratories.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general headings of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in. base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.65c.
Toe-calk, ½ x ⅝ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c
Shafting and Screw Stock:	
Rounds	4.15c.
Squares, flats and hex	4.65c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R. One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.30c. to 4.45c.	.....
Nos. 22 and 24	4.45c. to 4.60c.	5.10c.
No. 26	4.50c. to 4.65c.	5.15c.
No. 28*	4.60c. to 4.75c.	5.25c.
No. 30	4.70c. to 4.95c.	.....

Galvanized

	Per Lb.
No. 14	4.70c. to 4.85c.
No. 16	4.85c. to 5.00c.
Nos. 18 and 20	5.00c. to 5.15c.
Nos. 22 and 24	5.15c. to 5.30c.
No. 26	5.30c. to 5.45c.
No. 28*	5.60c. to 5.75c.
No. 30	6.10c. to 6.25c.

*No. 28 lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

Standard Weld	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt	46	29	½ in. Butt	4	+19
¾ in. Butt	51	37	¾ in. Butt	11	+ 9
1-3 in. Butt	53	39	1-1½ in. Butt.	14	+ 6
2½-6 in. Lap.	48	35	2-in. Lap	5	+14
7 & 8 in. Lap.	44	17	3-6 in. Lap	11	+ 6
11&12 in. Lap	37	12	7-12 in. Lap	3	+16

Bolts and Screws

Machine bolts, cut thread, 40 and 10 per cent off list
Carriage bolts, cut thread, 30 and 10 per cent off list
Coach screws, 40 and 10 per cent off list
Wood screws, flat head iron,
72½, 25, 10 and 5 per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright, basic	4.25c.
Annealed soft	4.50c.
Galvanized annealed	5.15c.
Coppered basic	5.15c.
Tinned soft Bessemer	6.15c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	18⅛c. to 19⅛c.
High brass wire	18⅝c. to 19⅝c.
Brass rods	15⅞c. to 16⅞c.
Brass tube, brazed	26⅛c. to 27⅛c.
Brass tube, seamless	22¾c. to 23¾c.
Copper tube, seamless	23¾c. to 24¾c.

Copper Sheets

Sheet copper, hot rolled, 20¾c. to 21¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Coke—14 x 20	Prime	Seconds
		80 lb.	$6.15	$5.90
		90 lb.	6.30	6.05
		100 lb.	6.45	6.20
IC..$11.25	$8.85	IC..	6.65	6.40
IX.. 12.85	10.85	IX..	7.85	7.60
IXX.. 14.40	12.55	IXX..	9.00	8.75
IXXX.. 15.75	13.85	IXXX..	10.35	10.10
IXXXX.. 17.00	15.05	IXXXX..	11.35	11.10

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits, pig	56c.
Bar	60c. to 63c.

Copper

Lake ingot	16¾c.
Electrolytic	16½c.
Casting	16 c.

Spelter and Sheet Zinc

Western spelter	9¼c.
Sheet zinc, No. 9 base, casks	12c. open 12½c.

Lead and Solder*

American pig lead	9½c. to 10c.
Bar lead	13c.
Solder, ½ and ½ guaranteed	38c.
No. 1 solder	36c.
Refined solder	28½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	18c. to 20c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.

Old Metals

The market is stronger and values are higher. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light bottoms	9.50
Brass, heavy	7.00
Brass, light	5.75
Heavy machine composition	8.50
No. 1 yellow brass turnings	8.00
No. 1 red brass or composition turnings	8.00
Lead, heavy	6.75
Lead, tea	5.00
Zinc	4.00
Cast aluminum	17.00
Sheet aluminum	17.00